The birds of North Rona and Sula Sgeir

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Leach's Petrel *Oceanodroma leucorhoa* caught for ringing, North Rona, Outer Hebrides, 14 May 2006. © *Sheila Russell*

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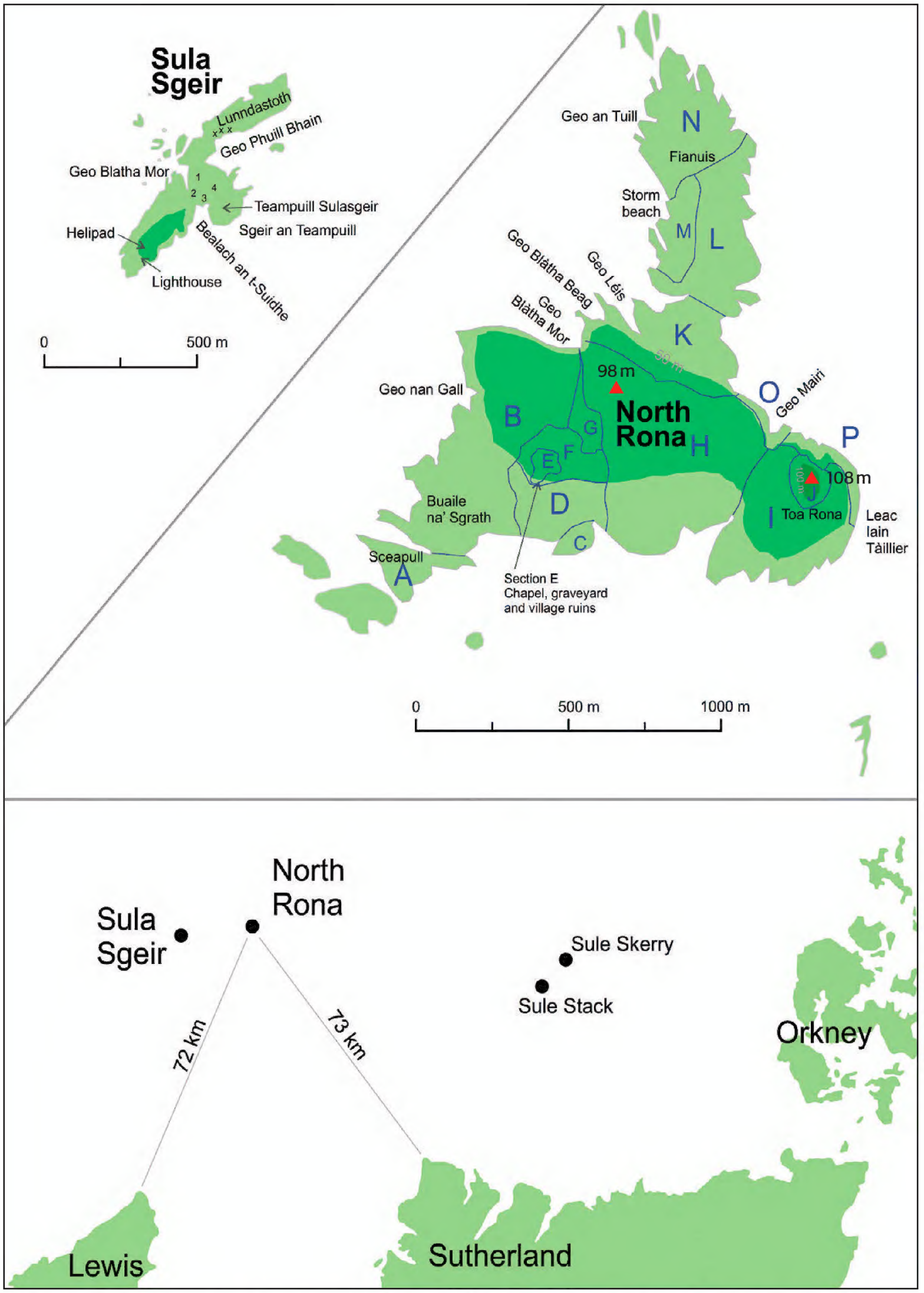

Figure 1. Maps showing the locations of North Rona and Sula Sgeir off north-west Scotland using place names mentioned in the text. Section boundaries on North Rona (A to P) used for species counts which follow prominent natural or man-made features. The summit of Toa Rona (J) is enclosed by an ancient ruined turf dyke. Positions of the four bothies (1–4) are indicated on Sula Sgeir with suggested bird-free landing places (xxx). © *Ian Andrews/SOC*

Plate 1. North Rona viewed from the south-east. The lighthouse is prominent on the highest point, Toa Rona at 108 m, 30 June 2017. © *Stuart Murray*

The birds of North Rona and Sula Sgeir

Introduction

North Rona and Sula Sgeir[1] are remote, iconic islands located at 59º 08'N 5º 50'W and 59º 06'N 6º10'W, respectively, just over 70 km north-east of the Butt of Lewis and a similar distance north-west of Cape Wrath on the Scottish mainland (Figure 1). The sea depth around the islands is about 45 m and the continental shelf edge lies approximately 40 km to the north-west. The two islands were designated as a National Nature Reserve in March 1956 with the agreement of the then owners, Barvas Estates (Galson Estate Trust since 2007). In 2001 they were classified as a Special Protection Area (SPA) under Article 4 of the European Birds Directive, and in 2005 they were designated a Special Area of Conservation (SAC) under the European Habitats and Species Directive. The primary interest at the time of designation was the Grey Seal *Halichoerus grypus* colony on North Rona, which used to be the biggest colony in the Western Isles (*c.* 2,000 pups born annually in the 1960s and 1970s). However, seal numbers declined 1995–2010 at a rate of about 5% p.a. with fewer than 400 pups born in 2016 and only 286 in 2019 (Special Committee on Seals 2019).

Plate 2. Sula Sgeir viewed from the north-west. The white areas are the Gannet colony. Note the contrast with the peninsula of Lunndastoth on the left that is bereft of birds and barren of vegetation, 30 June 2017. © *Stuart Murray*

[1] North Rona is widely known as Rona in the Hebrides but the full name is given here to avoid confusion with South Rona, near Skye which is locally also referred to as Rona. Sula Sgeir appears in many different spellings over the last century. A literal translation in modern Gaelic is Sgeir nan Sulairean but we use the abbreviated and widely used Sula Sgeir.

Plate 3. Aerial view of the west coast and cliffs of North Rona showing the low lying peninsula of Fianuis on the left and the fragmented peninsula of Sceapull on the right, 30 June 2017. © *Stuart Murray*

The name Rona derives from the Norse, meaning either island of seals or rough or rocky island. North Rona is approximately triangular in shape and has a surface area of 120 hectares. The island is composed largely of hornblende gneiss and amphibolite interspersed with pegmatite veins (Nisbet 1961). The vegetation is heavily influenced by the peaty soil, salt spray and grazing by sheep, the only terrestrial mammal present (Gilbert *et al.* 1973). It has a central ridge running west to east, which reaches a maximum height of 108 m at Toa Rona (Plate 1). Two low promontories extend from this ridge, Fianuis to the north and Sceapull to the south-west (Plate 3). Fianuis has the largest part of the seal colony and the vegetation is greatly influenced by the impact of these animals (Plate 4). There is a raised storm beach at the top of the low cliffs on the west side. The north side of the central ridge is considerably steeper than the south side and mid-way down the latter lies the site of an ancient, now ruined, village surrounded by evidence of past cultivation in the form of 'lazy beds'. The island has not been permanently inhabited since 1844, has no jetty or harbour and the only permanent modern building is an automatic lighthouse.

Sula Sgeir translates as 'gannet rock'. It is a rocky ridge of hornblende gneiss about 1 km long and 200 m wide, running north-east to south-west, reaching 70 m at its highest point (Plate 2). At its narrowest point it is about 60 m wide and only a few metres above sea level, allowing gale driven seas to overtop it, effectively dividing the island in two whenever conditions are stormy. Lunndastoth, the northern part, is bare rock with no vegetation and few birds. By contrast, the higher, southern half holds several species of seabird breeding in accessible situations at very high densities making them vulnerable to human disturbance. There is very little soil and consequently little vegetation. The island is subject to heavy erosive pressure from seabirds in summer and storms in winter. It has an automatic navigation light and a helipad but no harbour.

Plate 4. Grey Seal cows with new-born pups, Fianuis, North Rona. This annual event attracts hundreds of Great Black-backed Gulls to feed on the placentas and dead pups, 2 October 1981. © *Stuart Murray*

A combined total of 15 species of seabird breed on North Rona and Sula Sgeir, amply justifying the islands' status as a National Nature Reserve and Special Protection Area under the European Community

Directive of 1979 on the Conservation of Wild Birds. In 2014 the Scottish government put forward proposals for marine protected areas around Scotland with Rona and Sula Sgeir falling within the northernmost part of the Hebridean Zone. In 2021 seabird surveys were made by MarPAMM of both islands to bring population data up to date (https://www.mpa-management.eu/).

The senior author's involvement with the islands began in 1976 when he spent a week on North Rona as part of an expedition organised by P.G.H. Evans to count the breeding seabirds and investigate their diets and breeding success. His role was to catch and ring Puffins and sample their diet. Enjoying the work and the place so much, he returned on 13 subsequent summers. Many visits lasted less than a week but he was fortunate to be contracted by various agencies to make seabird counts which in several years led to longer stays. One such visit was to work on seals with SMRU in October 1981, an ideal month for recording bird migration. In total he has spent 145 days ashore on North Rona. The other two authors have also made brief visits to the island.

The senior author has a similarly long association with Sula Sgeir first landing there in 1980 followed by 17 subsequent visits up to 2017. Because of the risk of disturbing breeding birds, landings were always for specific reasons and of short duration, only once including an overnight visit. No landings were made during four visits, instead the island was closely examined from offshore to count breeding birds on steep cliffs not visible from the land. Five aerial surveys involving all three authors were made between 1985 and 2017 principally to photograph and subsequently count the breeding Gannets. These flights also included circuits of North Rona. As well as visiting North Rona and Sula Sgeir ourselves, we have corresponded widely with others who have visited, or are still visiting, the islands to provide as comprehensive as possible updated species lists (Benn *et al.* 1989).

In 1985 the Department of Energy issued a licence to British Petroleum (BP) to explore for oil in blocks 40–50 km to the north-west of North Rona. However, to date (July 2022) this has not led to the establishment of oil or gas production. In 1986, as part of an environmental study before any exploration went ahead, BP commissioned the Nature Conservancy Council (NCC) to survey seabirds in the area. The bulk of the work was conducted at sea, with observations made throughout the year from ships passing near the islands (Benn *et al.* 1988). In June 1986 a ship was chartered to conduct inshore surveys around the islands, and the opportunity was taken to count the numbers of breeding birds. These counts are presented here along with a compilation of previous and subsequent counts and an annotated list of records of other birds up to July 2022 known to us.

Abbreviations used in this paper

JNCC	Joint Nature Conservation Committee
MPA	Marine Protected Area
MarPAMM	Marine Protected Areas Management and Monitoring
NC	Nature Conservancy subsequently renamed NCC (Nature Conservancy Council)
SNH	Scottish Natural Heritage and finally NS (NatureScot) in 2020
NERC	Natural Environment Research Council
NHS	Ness Historical Society
NLB	Northern Lighthouse Board
RAFOS	Royal Air Force Ornithological Society
RCAHMS	Royal Commission on the Ancient and Historical Monuments of Scotland renamed HES (Historic Environment Scotland) in 2015
SARG	Shiant Auk Ringing Group
SAST	Seabirds at Sea Team
SMRU	Sea Mammal Research Unit
SOC	Scottish Ornithologists Club
SSRG	Sule Skerry Ringing Group

Human history of North Rona

Key events and dates in the history of North Rona are given in Stewart (1933) and Atkinson (1949) and the Ness connections with Rona are explored in detail in Robson (1991). The date of first human settlement is unknown. Nisbet & Gailey (1962) found no evidence for the existence of a pre-Christian population, although it is more than likely that people did live on North Rona during the prehistoric period. The first written account of life on North Rona (then called Ronay) is given by Monro (1774) who visited many of the Hebridean islands in 1549. During his travels he gathered information about other islands, like Ronay, but his account remained unpublished until 1774. He noted that the island economy was well organised by the mid-1500s and a limited self-sufficiency had evolved. He described the growing of barley and the export of a surplus as part of the rent to Macleod of Lewis. Excess cattle and sheep were also sent off the island. Martin (1716) wrote that five families were tenanting the island and MacKenzie (1682) stated that the population was self-regulating, with no more than 30 individuals being allowed to live on the island.

The precariousness of such a remote community, reliant on its own agricultural production and with only an unreliable annual link with Lewis, led to disaster in about 1683. Martin (1716) wrote 'a swarm of rats, but none knows how, came into North Rona and in a short time eat up all the corn in the island. In a few months after, some seamen landed there, who robbed the poor people of their bull. These misfortunes and the wont of supply from Lewis for the space of a year occasioned the death of all that ancient race of people'. Martin continued 'some years after, the minister (to whom the island belongeth) sent a new colony to this island with suitable supplies. The following year a boat was sent to them with more supplies and orders to receive the rents but the boat being lost, as it is supposed, I can give no further account of this late plantation'.

Plate 5. Aerial view of North Rona from the east showing the ruined village (the three groups of roofless buildings), and the graveyard, chapel and St Ronan's cell (enclosed within the sub-circular dyke). The whole complex is surrounded by the ironically named 'lazy beds', a cultivation system that was created and maintained entirely by hand, 30 June 2017. © *Stuart Murray*

After this second tragedy nothing is known with certainty until 1764 when the population numbered nine, probably a single family, tenants of the owner or a Ness tacksman (Walker 1812). This was the situation at the time of the first 'Statistical Account' (Sinclair 1797), with the tenant family paying annual dues in the form of 'corn, butter, cheese, sheep, cattle, wildfowl and feathers'. MacCulloch (1824) gave a first-hand account of life for one such family, the MacCaigies. They were followed by various others acting as tenant shepherds but the practice ended in 1844, when the last shepherd left the island after living there for a year. In June 1884 two elderly Ness men took up residence on North Rona but were found dead there in 1885. Persistent rumours of foul play led to the exhumation of the bodies but a post-mortem revealed that they had died of an unknown illness during the previous winter. They were given a respectful funeral when reinterred on the island (Atkinson 1949). Their deaths marked the end of permanent human occupation on North Rona.

North Rona was then rented by Lewis crofters who pastured about 150 sheep on the island. Their regular visits to maintain the stock became known as the 'Rona annual' described by, among others, Atkinson (1949). Following the community acquisition of Barvas Estate in 2007, North Rona and Sula Sgeir are now owned by the Ness crofters. Sheep numbers on North Rona have been reduced to some 80 breeding ewes.

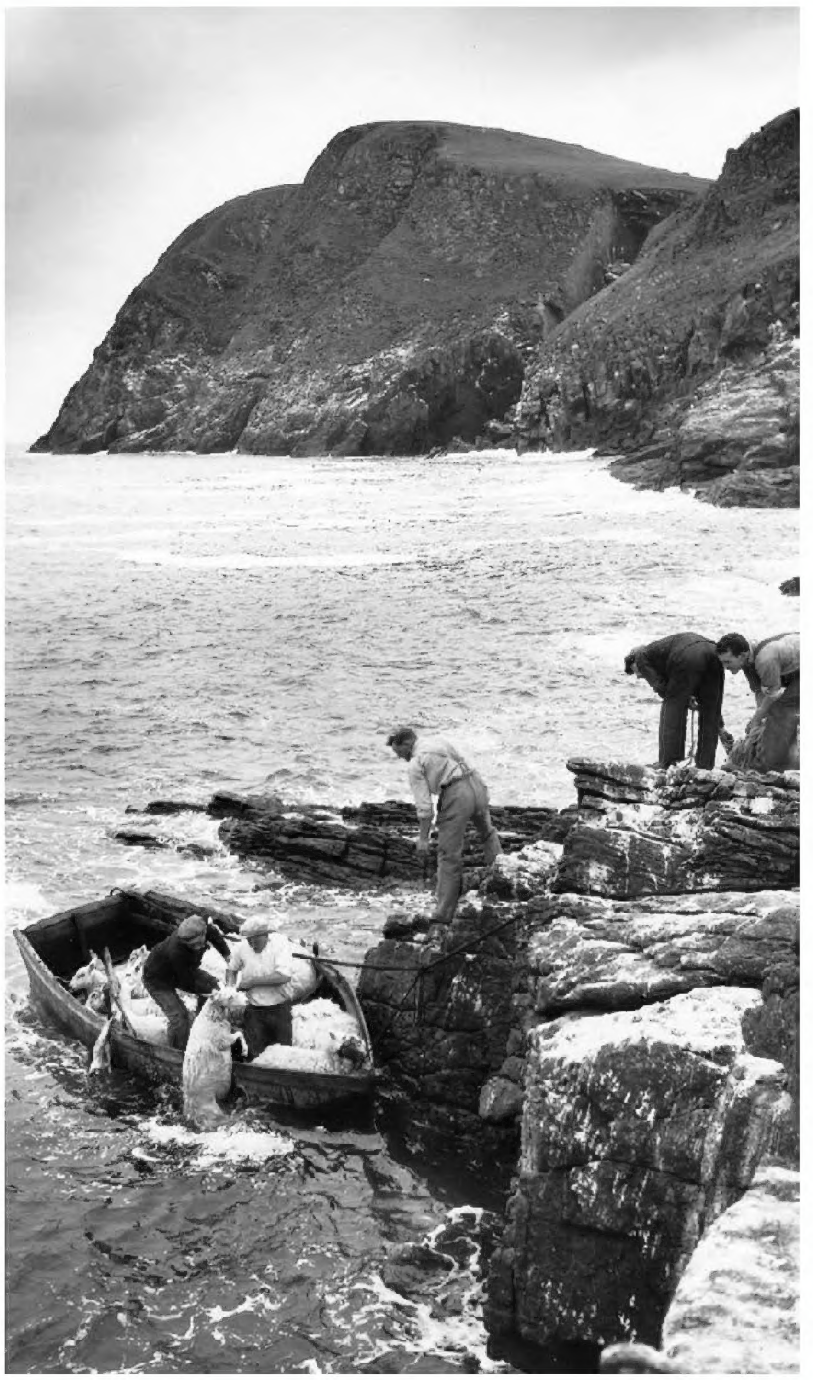

Plate 6. Ness crofters taking sheep off North Rona at Geo Stoth, Fianuis, North Rona, 28 July 1937. © *Robert Atkinson*

From 1824 until at least the middle of that century 'several crews were fishing from the island' (MacDonald 1978). Nothing is known of this activity from other sources but, if it did take place, it would only have been during the summer months. Later in the 19th century there were regular expeditions to kill seals but these had effectively ended by the early 20th century (Harvie-Brown & Buckley 1888, Atkinson 1980).

In 1941 a RAF Whitley bomber made a successful emergency landing on North Rona and the crew were taken off the island the next day (Plate 7). A salvage team sent to recover the wreck found the withered remains of a human corpse in one of the ruined houses. The body was never removed and by 1952 all that remained was a skull, which was buried in the graveyard wall (Studdy 1953). Full details of these events are given in Atkinson (1980) and Pomeroy (1990).

The ruins on North Rona include a Christian oratory known as St Ronan's cell, which was first described in detail by Muir (1861). It is considered to be post-Columban, with the date of its construction thought to be in the 8th or even 7th century AD. It survived intact until the roof was broken open by an Ordnance Survey party in 1852 or 1853. It was restored by J.M. Boyd and J.D. Lockie in 1959, so skilfully that it is impossible to tell where the old and new stonework merge. Adjoining the cell, but thought to have been built at a later date, is a now roofless

Plate 7. The RAF Whitley bomber on North Rona after its successful emergency landing. The plane was dismantled and taken off the island. It was reassembled and flew again operationally. © *'After the Battle'*

chapel. The interior was excavated and the fallen south wall rebuilt by F.F. Darling in 1939. In 1958 H.C. Nisbet and A. Gaily noted that the west gable was leaning outwards, and this finally collapsed during the winter of 1986/87.

Plate 8. Archaeologists Jill Harden and Sam Dennis excavating a small trial trench against the outside wall of the graveyard on North Rona. Below the wall were layers that included a midden full of broken and burnt bird bones that were too small to identify to species but subsequently dated to before 650 AD, 12 June 2012. © *Stuart Murray*

The oratory, chapel and graveyard are enclosed by a sub-circular wall, beyond which lie three distinct groups of dwellings, the whole complex surrounded by the well-defined ridges of lazy bed cultivation (Plate 5). Isolated bothies, ruined walls and enclosures are found across the island. Details of the antiquities, including a plan of the village, are given in Nisbet and Gailey (1962). The most recent, and complete, archaeological survey of the structures, was made by RCAHMS in 2009. Since then there has been on-going research, including small-

scale excavation by Harden *et al.* (2012, 2014). This has confirmed human occupation from before the mid-6th century AD, evidenced by small pieces of burnt bird bone in an anthropogenic deposit (Plate 8). Unfortunately, these were so fragmented that no identifications could be made of the species involved. Radiocarbon dating of burnt barley grains in the overlying layer confirmed continued (non-Christian) settlement into the mid-7th century AD. The C14 dates indicate that most, or all, of the ruins and certainly the enclosure wall around the early Christian site, are likely to date after this (i.e. after about 650 AD).

There are two modern buildings on the island. The first is a temporary shelter used by SMRU during their autumn seal work. It was originally erected close below the ruined chapel but subsequently dismantled and removed from the island in 1992. Its replacement was sited well to the east away from the area of archaeological interest. The second building is an automatic lighthouse on the island's highest point, Toa Rona. Construction began in June 1981 and the light was commissioned on 28 March 1984 (Plates 9 & 10).

Plate 9. Lighthouse on Toa Rona powered by solar panels that have replaced the previously polluting diesel engines. The ancient summit cairn in the foreground is nesting habitat for Leach's Petrels, 18 June 2016. © *Stuart Murray*

Plate 10. The wooden huts accommodated the lighthouse construction workers but they were blown away in hurricane force gusts the night after the men were flown off the island. The lighthouse was not completed until 1982 and was commissioned in 1984, 2 October 1981. © *Stuart Murray*

The future for North Rona

In the 21st century, annual human contact with North Rona mainly involves sheep husbandry by Lewis crofters, lighthouse maintenance by the NLB and, up until 2013, studies of Grey Seals by SMRU. The two former activities seem unlikely to change in the foreseeable future and are not detrimental to the island or its fauna and flora. A resumption of seal work is thought to be unlikely (P. Pomeroy pers. comm.).

However, tourism has increased greatly in the last twenty years, with specialist holiday companies offering North Rona as a destination. These cruises rarely land but when large numbers of people are put ashore unescorted they can have a detrimental effect on breeding birds for example, disturbance of nesting Eider in June 2012. More nefarious visitors are rare, although in 2006 two individuals were successfully prosecuted for killing Leach's Petrels and Storm Petrels dug from the village ruins for taxidermy purposes (Stewart 2009). However, to date the total number of visitors in any single year is still so low as to have little effect on the island or its wildlife.

Fortunately there are no jetties or deep water access that allow large vessels to tie up or come close inshore, which reduces the risk of invasive species such as Brown Rat *Rattus norvegicus* or American Mink *Neogale vison* being introduced. However, both species are found in Lewis and along the Scottish west coast so vigilance is needed.

Serious human impacts on the island are most likely to occur because of shipwrecks and associated pollution. The waters around North Rona have a considerable traffic of bulk-carriers and oil tankers and are also used by fishing vessels. The risks associated with these activities were highlighted on 13 October 1995, when the small beam trawler *Moray Adventurer* suffered engine failure and went aground on Fianuis (Plate 11). Fortunately, there were no rats on board and the small amount of fuel oil carried was pumped out and flown off the island by helicopter. The ship's fishing nets were set on fire to prevent wildlife becoming entangled. The whole vessel was rapidly broken up by winter storms, now 26 years later there is little visible on-shore aside from a few rusting, steel plates. The likelihood of a major shipwreck is probably low, but as the *Moray Adventurer* has shown, the possibility is real so long as vessels continue to pass in close proximity to the island.

In 1989 there were concerns about the impacts of potential oil and gas abstraction north-west of North Rona and industrial fishing for sandeels in the seas around the island. To date the oil exploration blocks remain undeveloped, as does industrial fishing, leaving the seabird populations unaffected from potential detrimental effects of both industries. However, the Scottish government has licensed the waters close to both North Rona and Sula Sgeir for future wind turbine sites, which may, if development does go ahead, impact on the seabirds in as yet unknown ways.

Those wishing to land or stay on either North Rona or Sula Sgeir should consult NatureScot (NS) which acts on behalf of Galson Estate Trust, beforehand. NS would be grateful for reports on all landings, particularly any interesting natural history records. These should be sent to NatureScot, 17 Francis Street, Stornoway, Western Isles HS1 2ND, and the Scottish Ornithologists' Club (SOC) bird recorder for the Western Isles.

Plate 11. *Moray Adventurer* aground on Fianuis, North Rona on 16 October 1995. It was set on fire to destroy the netting that was considered a risk to wildlife. © *David Maclennan*

Ornithology on North Rona

Early published accounts contain general descriptions of the wildlife but little detail relating to species. The 'swarm of rats' that appeared around 1683 (Martin 1716) failed to establish themselves but if they had the consequences would have been catastrophic for the small petrels. Visits by ornithologists are listed in Tables 1 and 2 and their activities are summarised briefly below.

Swinburne (1885) was the first naturalist to spend time ashore and despite having only a few hours he was able to prove that Leach's Petrels were nesting in 1883.

In 1885 and 1886, Harvie-Brown and Barrington respectively visited the island to try to prove that Fulmars were breeding (Harvie-Brown 1886). Both failed, and the first eggs were not found until Popham's visit in 1894 (Fisher 1952).

The Duchess of Bedford made four visits, the last in 1914. Ward (1919) visited the island with his brother for ten days in June 1914 'to observe the feeding habits of gulls uninfluenced by man'. D.M. Reid and M. Stewart spent a week ashore in 1930 and Stewart returned with T.H. Harrisson

Table 1. Visits to North Rona between 1883 and 1969 which produced ornithological records known to us (from Robson 1968, Dennis & Waters 1968, Nature Conservancy records). See Table 2 for later visits.

Year	Visitors	Dates	Sources
1883	J. Swinburne	20 June	Swinburne (1885)
1885	J.A. Harvie-Brown	16 June	Harvie-Brown (1886)
1886	R.M. Barrington	29 June-1 July	Harvie-Brown & Buckley (1888)
1887	J.A. Harvie-Brown	18-19 June	Harvie-Brown & Buckley (1888)
1894	H.L. Popham	29 June	Fisher (1952)
1907	Duchess of Bedford	One day in June	Bedford (1910)
1910	Duchess of Bedford	19 July & 25 August	Bedford (1910)
1914	F. Ward & brother	10 days early June	Ward (1919)
1914	Duchess of Bedford	21 June	Bedford (1914)
1927	J.W. Dougal	29 July	Dougal (1927)
1931	D.M. Reid, M. Stewart	31 July-4 August	Harrisson (1932)
1936	J.A. Ainslie, R. Atkinson	16 July-12 August	Ainslie & Atkinson (1937a)
1937	R. Atkinson, A.A. MacGregor	28 July	Atkinson (1949)
1938	F.F. Darling	12 July-30 September	Darling (1939b)
1938	F.F. Darling	15 November-22 December	Darling (1940)
1939	F.F. Darling	18-29 June	Darling (1943)
1946	R. Atkinson	27-28 July	Atkinson (1949)
1949	I.D. Pennie	17 July	Fisher (1952)
1952	R. Studdy	July date unknown	Studdy (1953)
1954	R.W.J. Smith	3 August	Smith (1954)
1958	J.M. Boyd, D.A. Ratcliffe, J. MacGeoch, D.N. McVean	3-5 June	Robson (1968)
1958	T.B. Bagenal, D.E. Baird	24 June-22 July	Bagenal & Baird (1959)
1959	K. Williamson, J. Boswell, W.J. Eggeling	10 May	Williamson *et al.* (1959)
1959	J.M. Boyd, H.R. Hewer, J.D. Lockie, J. MacGeoch	1-26 October	Boyd (1960)
1960	J.M. Boyd, M.J.W. Douglas, R.M. Laws, J. MacGeoch	16 October-7 November	Dennis & Waters (1968)
1961	J.M. Boyd, R.H. Dennis, A. Holmes	13-21 October	Dennis & Waters (1968)
1962	R. Balharry, J.M. Boyd	5-20 October	Dennis & Waters (1968)
1963	R.N. Campbell, R. Balharry, K. East, K.M. Wallace	25 October-4 November	Dennis & Waters (1968)
1964	R.N. Campbell, K. East, N. Picozzi, R. Tweedle	10-19 October	Dennis & Waters (1968)
1965	W. J. Eggeling	27 May	NCC files
1965	R.N. Campbell, R. Balharry	21-27 October	Dennis & Waters (1968)
1966	M.J.H. Robson	28 July-19 August	Robson (1968)
1966	J.M. Boyd, A. Christie, R. Tweedle, P. Wormall	24-31 October	Dennis & Waters (1968)
1967	R. Balharry, R.N. Campbell, H.H. Kolb, W. J. Eggeling, D.R. Shelly.	16-27 October	Dennis & Waters (1968)
1968	M.E. Ball, R. Moss	Seven days in October	NCC files
1969	M.E. Ball, J. MacGeoch, D. Wilson, E.M. Matthews	One day in June, five days in July	NCC files

Table 2. Days per month when observations were made on North Rona in 1970–2022.

Year	Month												Observers
	J	F	M	A	M	J	J	A	S	O	N	D	
1970										1			R.N. Campbell, N. Picozzi, E.M. Matthews
1971						1	11			1			J.M. Boyd, J.A. Love, P.G.H. Evans, A. Currie
1972						5	10		30	31	30	3	M.P. Harris, P.G.H. Evans *et al.*, J.A. Love *et al.*, A. Currie, RAFOS, NCC, SMRU
1974							14			1			J.A. Love *et al.*, SMRU
1976						5	3						P.G.H. Evans, S. Murray *et al.*, R.N. Campbell, A. Currie
1977					1					14			N. Picozzi, A. Allsop, SMRU
1978										24	2		SMRU
1979										25	7		SMRU
1980						4	2	1		29	3		M.P. Harris, S. Murray, R. Broad, H. Birley, M. Warren, SMRU
1981						1	1			30	1		P. & G. Sparks, S. Murray, N. Buxton, SMRU
1982										2			W.A.G. Cunningham. M. E. Ball, SMRU
1983							4	5					A. Currie, N. Buxton, R.V. Collier
1984							7	1					D. Budworth, A. Blackburn *et al.*
1985				1				1		26			S. Rae, B. Jones, N. Buxton, SMRU
1986			1		12					30	1		SAST, M.D. Crewe, R.V. Collier, SMRU
1987					2		13						C.J. Camphuysen, D.P. Hodson *et al.*
1989					8	6							J. de Karte et *al.*
1993						6							S. Murray, SNH *et al.*
1998						5							J. A. Love, A. Stevenson, SNH
2001				1		6	16						S. Rae, S. Murray, S. Money, A. Griffin
2004					2								S. Murray *et al.*
2005					2								S. Murray *et al.*
2006					3								S. Murray, S. Wanless *et al.*
2009						4	10						S. Murray *et al.*, RCAHMS
2011						1							S. Murray, J. Harden, M. Smith, SNH
2012						18							S. Murray J. Harden, K. Jamie, M. Smith, L.J. Wilson, S. Dennis, T. Marr, NHS
2013							4						S. Murray *et al.*
2015						10	4						S. Murray, J. Harden, S. Elliott, D. Jones
2016						1							S. Murray *et al.*
2017						2							J. Lennon, D. Steventon, N. Winn
2021						2	1						J. Lennon, A. Clunas *et al.* for MarPAMM
2022						1							J.A. Love

in 1931. The combined records of both visits and a review of the older records back to 1884 were published by Harrisson (1932).

Ainslie and Atkinson (1937a–c) spent a month on the island in 1936 to study the breeding behaviour of Leach's Petrels and estimate the size of the population. They also made whole island counts of gulls, auks and Shags, Darling (1939b, 1943) made two visits in 1938 and a short summer visit in 1939. Although his main interest was the seals, he also documented the autumn and early winter birdlife on the island.

The first visitor after World War 2 was R. Atkinson in 1946 (Atkinson 1949). Between then and 1956 when the island became a National Nature Reserve, there were few visits and all were of short duration. In June 1958 there were visits by a Glasgow University expedition (Bagenal & Baird 1959) for a month and a NC team led by J.M. Boyd for three days. The latter was the forerunner of long-term research into Grey Seals that covered all or part of each October from 1959 to 1967, and contributed records of 116 bird species (Dennis & Waters 1968).

In 1969 'Operation Seafarer' undertook the first complete census of British and Irish seabirds (Cramp *et al.* 1974). J. MacGeoch and D. Wilson were responsible for the counts on North Rona.

Their time was very short and some sections of coast were not visited but nevertheless they made some useful population estimates.

Three short autumn visits were made between 1968 and 1971. In 1972 SMRU was contracted to continue the Grey Seal work and stayed on the island from 5 September to 6 December. Thereafter, they were present each October from 1977 to 1982 and in 1985 and 1986. Although the priority was the seal work there was good coverage of the autumn migration in 1972, 1979 and 1981. The seal work and likewise bird recording, continued until 2013. Love (1974, 1978, 1982) made fortnight-long visits in 1971, 1972 and 1974, mainly to undertake population studies of small petrels by intensive ringing but he also counted the Kittiwakes and large gulls. P.G.H. Evans carried out feeding studies of young auks and Kittiwakes and conducted work on gull and Puffin populations in 1971, 1972 and 1976 (Evans 1973, 1975, 1976a, b). He was the first to use tape-recorded calls to elicit responses from incubating Leach's Petrels but did not attempt a whole island population survey using the method.

M.P Harris and others estimated Puffin numbers and ringed petrels in June 1980 and D. Budworth and A. Blackburn spent eight days on the island in July 1984, mainly to ring Leach's Petrels (Blackburn 2012).

In June 1986 there was a combined land and offshore survey of both North Rona and Sula Sgeir by NCC and SAST (Benn *et al.* 1987). Complete counts were made of all the breeding seabirds (except for the small petrels) for the 'Seabird Colony Register', the second census of British and Irish seabirds (Lloyd *et al.* 1991). These results were included as part of a historical review of seabird counts, along with an updated list of migrants to 1987 and published as 'Birds of North Rona and Sula Sgeir' (Benn *et al.* 1989).

J. de Karte spent eight days on the island in May 1989 trapping and colour ringing breeding Great Skuas (de Karte 1990). S. Murray and J.A. Love visited for 10 days in June 1993 ringing petrels and assessing the Puffin population (Murray & Love 1994, Murray 1995). J.A. Love and A. Stevenson ringed small petrels and made seabird counts in June 1998 (Love & Stevenson 1998).

In 2001, as part of the 'Seabird 2000' national seabird census, a team made a visit in mid-April and counted Black Guillemots, returning for three weeks in June–July to count all the breeding seabirds, including for the first time, Leach's Petrels and Storm Petrels by means of tape-playback (Murray *et al.* 2008). These surveys were repeated in 2009 and 2015 (Murray *et al.* 2010, 2016) and found that Leach's Petrel had seriously declined but numbers of Storm Petrels were unchanged. Also in 2001, G.L. Mortimer colour ringed large numbers of Great Black-backed Gull chicks.

In 2005 A. Stevenson made the first nest count (as opposed to territory counts made from a distance) of Great Black-backed Gulls (Stevenson 2005) and found a major population decline since the mid-1970s.

In 2010 Leach's Petrels were blood sampled under license. No genetic differences were found between birds from North Rona and those from colonies elsewhere in the North Atlantic (Bicknell *et al.* 2012).

In 2012 all 14 seabird species breeding annually on North Rona were counted and nine of these were found to have declined significantly since 1986 (Murray & Wilson 2013a).

The small petrels have continued to be the focus of interest for ringers, with SSRG being particularly active, making five visits between 2005 and 2011 (Blackburn 2012). Other visits were made by G. Mortimer in 2002, J.A. Love in 2006, S.C. Votier in 2010, S. Murray in 2012 and 2015 and J. Lennon and others in 2017.

SMRU have also added autumn records, principally geese, ducks and waders, and the only Snowy Owl. However, the increased pressures of seal work and the lack of ornithologists in the team has resulted in reduced bird recording and consequently many fewer records in later years as compared to the autumns of 1959–67. The most recent seabird work involving both cliff nesters and nocturnal petrels took place in 2021 for the MarPAMM project, the primary purpose of which was to support the proposed Hebridean MPA.

Up to 2022, 21 new species had been added to the island list compiled in 1987 (Benn *et al.* 1989). Of these, day visitors from cruise ships recorded 12 species in May or June, all since 1998. Nine were passerines, including the 4th Scottish record of Trumpeter Finch (McMillan 2009).

Of the 139 years between 1883 and 2022 bird records are available for 64 years (Tables 1 & 2). The majority of visits have been in the summer between May and August but records have been made in all months except January and February. Thanks to the autumn seal work conducted by SMRU and others there are 20 years of records made on various dates between September and December, with good coverage for part, or all, of October in these years. Given the increased number of visitors and unrecorded landings, it is no longer possible to keep track of records that might result from shorter more opportunistic visits unless these are reported to NS in Stornoway or the current SOC recorder for Western Isles birds.

Human history of Sula Sgeir

Sula Sgeir is too small and barren to have ever had a resident human population but it is the setting of a unique and centuries-old tradition - the 'guga hunt' carried out by men from the parish of Ness on Lewis in late August and early September. They have exercised their traditional right to kill the guga, the young Gannet, since at least 1549 (Monro 1774), How regularly they were able to do so in earlier centuries is unknown but given the hazards of sailing small open boats in Hebridean waters in late summer it is unlikely they were successful every year. MacGeoch (in Bannerman 1959) stated that there were 19 hunts between 1919 and 1958 with an average annual kill of 2,360 gugas. However, since 1949 the hunt has taken place almost annually, with up to 4,000 gugas taken in some years (reports in Stornoway Gazette) and MacGeoch reported 5,000 taken in 1968 (NCC files 1968).

Plate 12. Robert Atkinson (left) and John Ainslie (right) on North Rona. They came prepared to live off the land in an emergency, but "neither duck or goose fell to the gun". However, "experimentally we ate a young Fulmar fried in its own grease" The verdict - "A chicken cooked in engine oil might have been similar", July 1936. © *Robert Atkinson*

The 'Protection of Birds Act 1954' gave the Gannet complete protection in Britain but the 'Gannets on Sula Sgeir Order 1955' allows the Ness men to continue the guga hunt. The introduction of the 'Wildlife and Countryside Act 1981' required the licensing of the hunters, the taking only of birds of the year and a quota set by NCC, now by NS. The quota was set at 2,000 birds and has remained at that number up to the present (2022). Licence returns submitted for 2011–21 give totals ranging 1,723–2,000 gugas. However, there is no independent check on the numbers killed or collateral damage associated with the disturbance caused. The impact of the guga hunt has been extensively discussed by e.g. Stewart (1938a,b), Nelson (1978), Murray *et al.* (2006), Wanless *et al.* (2015), Trinder (2016) and Jeglinski (in review). The counts indicate that the Sula Sgeir population has been able to sustain long term

harvesting but it seems likely that this is as a result of net immigration and the colony acts as a population sink.

The hunt takes place when, apart from the Gannets themselves, only Fulmars will be disturbed. However, any effects on the Fulmar population cannot be too serious since the number of breeding Fulmars has increased dramatically, from less than 150 in 1932 to several thousand at present.

Plate 13. Life in the roofless village house on North Rona that was jokingly referred to as the Manse c.1960. It was the HQ for the early years of the seal work but was neither wind nor waterproof. It was eventually replaced with a wooden hut that gave basic protection against the elements, essential during autumn and winter. Left to right Malcolm Douglas, John Morton Boyd, Jimmy MacGeoch and Dick Laws. Boyd's enthusiasm for North Rona was the driving force behind the Grey Seal studies, putting the work on a firm scientific basis, before handing it on to NERC and SMRU. The photo was taken using a timer and was discovered and supplied by John A. Love.

The only historic artefacts on Sula Sgeir are connected with the guga hunt. These are stone bothies built to shelter the Ness men during their time ashore. One bothy served solely as a chapel and was the focus of interest for antiquarians in the 19th century (Muir 1885). This Teampuill Sulasgeir (the blessing house) or Tigh Beannaichte is now in ruins and unused but the other structures remain and were later described by Stewart (1933) and Nisbet (1961). The most recent survey of all the standing structures made by RCAHMS in 2009 found evidence of other, long-demolished buildings (J. Harden in prep). The history and social importance of the guga hunt from the Ness men's perspective is discussed by Murray (2008). Film and photographic documentation of the hunt was made by MacGeoch in 1954 (2010) and Beatty (1992). The only other structure on the rock is an automatic light-beacon on the highest point built in the winter of 1981/82 by the NLB and commissioned in December 1982.

During World War 1 the Royal Navy apparently used the island for target practice. Stewart (1938b) stated that 'shell fire practise by warships made a large number of Gannets desert Sula Sgeir' but gave no source for this statement. The only confirmed instance when this occurred is 23 December 1914 (Jellicoe 1919), at which time Gannets would not have been present. In 1962 R. Atkinson carried out a search of Admiralty archives but found no further corroborative evidence, although the Ness men are reported to have found the remains of a naval shell (Murray 2008).

The future for Sula Sgeir

Only the Ness men stay on Sula Sgeir for any length of time, up to two weeks or more. Annual visits by the NLB are short day trips by helicopter. Increasingly the island has become a focus of interest for natural history tourism. Sixty-seven people from a National Trust for Scotland cruise landed in 1965 but although cruises organised by specialist companies now visit annually these do not involve landings. This is fortuitous because landings by even small groups pose a real threat to the seabirds, particularly if they occur between May and July, when the extremely high density of breeding birds makes moving around on the rock impossible without causing the loss of eggs or chicks. Thus, casual visits to Sula Sgeir are to be strongly discouraged and should go no further than the bothy area. Going ashore on the bird-free shore of Lunndastoth (Figure 1) reduces disturbance, by contrast, landing at Geo Phuill Bhain in summer would cause major egg and chick loss among breeding Guillemots.

Ornithology on Sula Sgeir

The ornithological history of Sula Sgeir is impoverished. The record begins with Monro's (1774) brief account of the fowling activities of the Ness men in the 16th century who referred only to 'wild fowls', giving no indication of the seabird species involved. However, it seems unlikely they would have made such a hazardous journey for anything smaller than a Gannet. His one bird description is that of the 'colk', recognisably a female Eider.

Martin (1716) confined his description of Sula Sgeir to a bird list, including Gannet, Guillemot, Puffin and 'several other sorts'. Once again the 'colk' was described, but in this instance it is the male Eider. The antiquarian Muir (1861) landed in 1860 and gave a brief description of the birds he saw - 'myriads of solan geese [Gannets] to say nothing of Fulmars, Puffins and scarts' [Shags].

Swinburne's visit in 1883 was the first by a naturalist and he gave priority to the birds. He spent a few hours ashore, and his brief observations set the pattern for the next century of visitors. Harvie-Brown landed on the rock in 1887 but gave only general descriptions of the birds, although he described the extent of the gannetry in some detail, and noted that Razorbill were unusually abundant.

The early 20th century saw an increasing interest in the seabirds of the rock, especially Fulmar, small petrels and Gannet. The next records came from the geologist J.W. Dougal, who during four hours ashore in 1930 saw the only Wren recorded. M. Stewart (1933) stayed on the rock for 36 hours on 23–24 July 1932 and mapped the limits of the gannetry. He made no attempt at an accurate count of the colony but stated that 6,500 adults were present. Stewart (1934) mapped the

Plate 14. An aerial view of part of the Gannet colony on Sula Sgeir showing the navigation light and the helipad. This was one of the images used to count the number of AOS on 30 June 2017. © *Stuart Murray*

limits of the gannetry and estimated numbers in 1932. He was the first ornithologist to spend a night ashore and proved breeding of Fulmar. He returned for a day in August 1937 and again counted and mapped the Gannets (Stewart 1938b). R. Atkinson and J. Ainslie remained overnight on the rock on 3–4 August 1939, mapped the limits of the gannetry and proved breeding of Leach's Petrel (Atkinson & Ainslie 1940). J. Fisher and F.F. Darling made separate visits in June 1939 to make an accurate counts of the gannetry. Fisher & Vevers (1943) produced a comprehensive account of the Gannet colony citing all published references up to 1939.

After World War 2 visits by naturalists resumed in 1949, when I.D. Pennie counted the Gannets and ringed a small number. In 1954 J. MacGeoch was allowed to accompany the Ness men and to film the gannet hunt in its entirety. He ringed Gannets and Fulmars and also recorded migrants (MacGeoch 1954). His stay of 19 days was by far the longest of any naturalist, and longer than any of his four subsequent visits up to 1968.

Sula Sgeir was declared a National Nature Reserve in 1956. Thereafter the number of visits by scientists increased. In 1958 the Glasgow University Expedition to North Rona landed six of their party on Sula Sgeir for 24 hours and a small number of Leach's Petrels and Storm Petrels were ringed (Bagenal & Baird 1959).

In 1959 R. Studdy and M. Smith spent five days ashore (Studdy 1960), a longer period than any subsequent visit. P.G.H. Evans counted the entire seabird population in 1972.

M.P. Harris spent a night ashore in 1980, mainly to assess the Puffin population, and SAST counted most of the surface-nesting seabirds in June 1986 (Benn *et al.* 1989).

In 1998 JNCC made counts and estimates of some of the breeding seabirds (Mitchell *et al.* 2004). In 2001 and 2009 limited searches for breeding petrels were made (Murray *et al.* 2008, 2010). Between 2005 and 2007 there were at least four visits by charter vessels hired by birders to search for the Black-browed Albatross present in those years. As far as is known no landings were made during these visits although new species were added to the island list.

In 2009 and 2011 the first bird ringing (400 Gannets and 35 Guillemots) since 1958 was carried out (Blackburn 2012). J. Lennon and SARG carried out further ringing in 2017. In 2012 a partial island count of Guillemots and a whole island count of Kittiwakes found serious declines had occurred in both species since populations peaked in 1986 (Murray & Wilson 2013a). In 2021, J. Lennon and SARG for MarPAMM counted all breeding seabirds except Gannets and nocturnal petrels.

There have been seven aerial surveys of Sula Sgeir beginning with an attempt by R. Atkinson on 30 July 1947 (Atkinson 1949). On 8 July 1969, the RAF flew the first successful survey, principally to make a Gannet count for 'Operation Seafarer'. Subsequently there have been five more aerial Gannet surveys: 1985 (Murray & Wanless 1986), 1994 (Murray & Wanless 1997), 2004 which included Fulmar (Murray *et al.* 2006), 2013 (Wanless *et al.* 2015) and 2017 which included Guillemots (this account).

The most regular visitors to the rock are the Ness guga hunters, but their single-minded attention to Gannets leaves them little time for the finer points of bird identification, although they were responsible for finding and publicising the arrival of a Black-browed Albatross during the 2005 hunt. Between 1883 and 2021 there have been 54 documented visits to the rock by naturalists (Table 3). This represents less than 100 days of observation in the last 138 years. The majority of visits have been in June with most records coming from mid-May to early September, and the latest date being 20 October 1962. Table 3 summarises all known dates when records of birds have been made up to 2021.

Sources of records and information

Records of all species recorded on North Rona and Sula Sgeir are drawn from the following sources:

1. Previously published work compiled up to 1987 and given in *'Birds of North Rona and Sula Sgeir'* (Benn, Murray & Tasker 1989).
2. Personal records since 1987.
3. Records on file in SNH (NS) Stornoway compiled by J.A. Love.
4. Correspondence with people known to have visited or worked on the islands.
5. Records published in *'Outer Hebrides (Western Isles) Bird Reports'* since 1987.
6. Responses to requests in *Scottish Birds* for unpublished information.
7. The Seabird Monitoring Programme organised by JNCC (https://app.bto.org/seabirds/public/data.jsp).

Species in the main lists have been accepted by British Birds and Scottish Birds Rarities Committees, unaccepted or uncertain records are listed separately. All records up to June 2022 known to us are included. Coverage is very uneven and doubtless more species would be added to the list if observations were carried out more frequently. Whereas 171 species have been seen on North Rona, only 51 have been reported from Sula Sgeir.

To simplify and shorten the lists, observers are not generally cited. Prior to 1987 few parties visited the islands and observers can normally be identified by reference to Tables 1–3 and/or the reference list. Subsequently it has not proved possible to compile comprehensive lists of visitors but those who have contributed records or new information are listed or named in the acknowledgements.

Table 3. Visits to Sula Sgeir that produced ornithological observations.

Year	Visitor	Date	Source
1549		?	Monro (1774)
1695		?	Martin (1716)
1860	T.S. Muir	11 July	Muir (1861)
1883	J. Swinburne	19 June	Swinburne (1885)
1887	J.A. Harvie-Brown, W. Norrie, R.F. Heddle	19-20 June	Harvie-Brown & Buckley (1888)
1930	J.W. Dougal	One day in September	Dougal (1937)
1932	M. Stewart	23-24 July	Stewart (1933)
1937	M. Stewart	5 August	Stewart (1938a,b)
1939	J. Fisher	4 June	Fisher & Vevers (1943)
1939	F.F. Darling	29 June	Darling (1943)
1939	R. Atkinson, R. Ainslie	3-4 August	Atkinson (1949)
1947	1st aerial survey	30 July	Atkinson (1949)
1949	I.D. Pennie	17 July	Fisher (1952)
1954	J. MacGeoch	21 August-9 September	MacGeoch (1954)
1957	J. MacGeoch	28 August-11 September	Bannerman (1959)
1958	T.B. Bagenal, D.E. Baird	29-30 June	Bagenal & Baird (1959)
1958	J. MacGeoch	12 days August/September	Bannerman (1959)
1959	R. Studdy, M. Smith	5 days in July	Studdy (1960)
1962	J.M. Boyd, T. Dow	21 May	NCC files
1962	E. Waters	20 October	NCC files
1965	W.J. Eggeling and 67 others	27 May	NCC files
1968	J. MacGeoch	23 August	NCC files
1969	2nd aerial survey	8 July	Cramp *et al.* 1974
1969	E.M. Matthews, M.E. Ball	26 July	NCC files
1971	P.G.H. Evans, A.N. Osborn	17 June	Evans (1971)
1971	J.M. Boyd, R.V. Collier, G. McKay	23 June	NCC files
1972	P.G.H. Evans *et al.*	7 July	Evans (1972)
1980	M.P. Harris, S. Murray	23-24 June	NCC files
1980	H. Birley, R.A. Broad	2 August	NCC files
1985	B. Jones	14 May	NCC files
1985	S. Murray, R. Simpson	15 June	Murray & Wanless (1986)
1985	3rd aerial survey	15 July	Murray & Wanless (1986)
1985	N. Buxton	? August	NCC files

1986	SAST	16 June	NCC files
1986	SAST	18 August	Burton *et al.* (1987)
1990	E. Waters, D. Andrew, D. Wilson	26 July	E. Waters
1993	E. Waters, D. Andrew	19 June	E. Waters
	S. Murray *et al.*	15 June	S. Murray
1994	4th aerial survey	15 July	Murray & Wanless (1997)
1998	M.L. Tasker, S. O' Brien, G. Leaper	14 June	Mitchell *et al.* (2004)
2001	S. Murray, S. Money, A. Griffin	24 June	S. Murray
2001	S. Murray, S. Money, A. Griffin	15 July	Murray *et al.* (2001)
2004	S. Murray *et al.*, no landing	19 May	S. Murray
2004	5th aerial survey	26 May	Murray *et al.* (2006)
2005	S. Murray and 6 others	12 May	S. Murray
2006	S. Murray, S. Wanless, M. Brooke, J.A. Love, J. Harden, S. Russell	14 May	S. Murray
2009	S. Murray, J. Harden, K. Jamie, T. Dee, RCAHMS	5 July	Murray *et al.* (2010)
2009	J. Blackburn *et al.*	July	Blackburn (2012)
2011	S. Murray *et al.*, no landing	11 June	Murray *et al.*(2011)
2011	J. Blackburn *et al.*	21 July	Blackburn (2012)
2012	S. Murray, L.J. Wilson	13 June	Murray & Wilson (2013a,b)
2013	6th aerial survey	18 June	Murray *et al.* (2014)
2014	S. Murray *et al.*, no landing.	24 June	S. Murray
2016	S. Murray *et al.*, no landing	18 June	S. Murray
2017	7th aerial survey	30 June	Murray (2018)
2017	J. Lennon *et al.*	6 July	Lennon & Steventon (2017)
2021	J. Lennon *et al.*	20 June	Lennon *et al.* for MarPAMM

Plate 15. Linda Wilson and Sam Dennis about to survey the roofless ruin of the Teampuill Sulasgeir with scattered nesting Fulmars, and Guillemots standing on rocks in the background. The cairns have been erected over centuries by the Ness guga hunters and added to after every visit, 13 June 2012. © *Stuart Murray*

Table 4. Comparable counts of seabirds on North Rona in June and early July between 1986 and 2021. In 1998 and 2005 counts were made by SNH (Stornoway), in 2021 by MarPAMM and in the remaining years by S. Murray.

		Year								
		1986	1993	1998	2001	2005	2009	2012	2015	2021
Species	Unit	11–24 June	14–24 June	13–18 June	29 June –1 July	14–18 June	27 June –10 July	2–19 June	20 June –4 July	19 & 21 June
Kittiwake	AON	3,972	4,197	2,913	3,398	1,837	987	923	630	447
Great Black-backed Gull	AOT	733	851	983		551		191 AON		47
Herring Gull	AOT	69		40		15		10		1
Lesser Black-backed Gull	AOT	6		3		3	2	0	0	0
Arctic Tern	IND	0	14	20	50	56	120	40	100	120
Great Skua	AOT	14	18	19	16	17	18	31		37
Guillemot	IND	17,802		10,497		6,113		4,961	5,741	1,853
Razorbill	IND	1,236		824		543		513	540	328
Black Guillemot	IND	56		26	23	16		40		1
Puffin	AOB	4,750			5,265			7,000		467 +2,780 IND
Storm Petrel	AOS				362		313			
Leach's Petrel	AOS				1,084		713		606	
Fulmar	AOS	3,738		3,520		2,616		1,438		1,204
Shag	AON	143		156		21		83	85	40

Methods of counting breeding seabirds

Methods for censuses of seabirds have varied, and meaningful comparisons between counts made before 1986 and subsequently are often difficult. Many of the visits were made in July which is too late in the season to assess breeding populations of many species, particularly Guillemots and Razorbills many of which will have left the islands by then. Confusion has also arisen from the use of different counting units, particularly in the cases of auks and gulls. Finally, most of the early naturalists gave only descriptive accounts of the numbers of birds, without quantifying them, so the first quantitative estimates for many species were not made until the 1930s. Historic population trends are therefore difficult to discern. Various methods have been adopted to count Gannets on Sula Sgeir including counts of individual adults, chicks in nests, pairs and since 1985 apparently occupied sites (AOS) counted from aerial photographs.

However, from 1986 onwards most counts have used standardised techniques developed for the Seabird Colony Register (Lloyd *et al.* 1991, Walsh *et al.* 1995). These count units differ between species. For example, 'apparently occupied nest' (AON) is used to count Shag and Kittiwake while 'apparently occupied territory' (AOT) or nest (AON if these are deliberately searched for) are used for Great and Lesser Black-backed Gulls, Great Skua and Arctic Tern. Guillemot and Razorbill are counted as 'individuals' and Puffin as 'apparently occupied burrows' (AOB) or 'individuals' if breeding areas are inaccessible. Fulmar and Gannet are counted as 'apparently occupied sites' (AOS).

Only since 1986 has a satisfactory method been found for estimating breeding numbers of small petrels (Gilbert *et al.* 1999, Ratcliffe *et al.* 1998). The tape recorded chatter call of Leach's Petrel, or the purr call of Storm Petrel are played in order to elicit a response from an incubating adult within a burrow. Counts are expressed as 'apparently occupied sites' (AOS).

On North Rona most counts can be made from the land with only a few small areas of cliff, or the interiors of caves, out of sight and requiring counts from the sea. Due to the density of breeding birds on Sula Sgeir many counts are estimates rather than actual counts, but Gannet AOS have been counted from aerial photographs.

For brevity, the various units have sometimes been expressed as 'pairs', 'individuals' or acronyms in the text and tables.

Birds of North Rona

Brent Goose *Branta bernicla*
Singles present 18–24 June and 13 October 2001.

Canada Goose *Branta canadensis*
Two on 31 October 2001. Three 27 June to 3 July 2009.

Barnacle Goose *Branta leucopsis*
Regular in October and November. Peak numbers of 150 on 20 October and 200 on 30 October 1979. Few spring/summer records but seven birds on 11 June 2011.

Snow Goose *Anser caerulescens*
Flock of eight white morph adults mid-October 1994 (Plate 16). The month is suggestive of misdirected migrants but the possibility of them being feral birds cannot be discounted.

Greylag Goose *Anser anser*
Breeding on 5 June 2012 when four adults were seen escorting five goslings.

Recorded in small numbers late spring/summer in most years between 1936 and 2012. Thirty unidentified geese on 31 July 1984 were probably this species. Seen most Octobers with a maximum of 200 on 7 October 1971.

Pink-footed Goose *Anser brachyrhynchus*
Passage south in mid-October with peak numbers of 140 on 9 October 1962 and 120 on 13 October 1979. Occasional in spring in small numbers with some staying to early July.

White-fronted Goose *Anser albifrons*
Singles of the Greenland race *A. a. flavirostris* in October 1961, 1963 and 25 September to early October 2001.

Whooper Swan *Cygnus cygnus*
Regular in autumn, mainly October, late records 10 November 2001 and 23 November 1939. Peak counts of over 50 on 29 and 30 October 1960. Very few spring records, singles in May 2004 and June 2009, six on 9 May 2007, with two on 3 June. Dead adults found in June 1986 and 2001.

Shelduck *Tadorna tadorna*
Single on 2 June 2012.

Wigeon *Mareca penelope*
Mostly in autumn, especially October, but also in September, November and December. Maximum count of 45 on 11 November 1972. Three summer records, a female on 13 June 1998, single males 17 June 2005 and 26 June 2015.

Plate 16. Snow Geese on Fianuis, North Rona, October 1994. © *Paddy Pomeroy*

Mallard *Anas platyrhynchos*
Recorded in March and from May to December with most in the autumn. Maximum of 12 on 4 November 1972.

Pintail *Anas acuta*
Nine on 8 September 1938, present October 1963, two on 11 October 1964 and two on 29 October 1966, seven on 22 October 1981.

Teal *Anas crecca*
Two on 11 May 2005, one on 23 May 2005. Recorded in all months from June to November but mostly in October. Maximum of about 50 on 24 October 1981.

Pochard *Aythya ferina*
Three on 6 November 1972.

Tufted Duck *Aythya fuligula*
Single 9 October 1959. A male and female on 24 and 25 October 1981, a male on 29 May 1987, two males 11 May 2005, one on 23 May 2005, single males 15–17 June 1998 and 29 June 2009.

Scaup *Aythya marila*
Single in late autumn 2007.

King Eider *Somateria spectabilis*
Male in summer plumage on 22 June 2015.

Eider *Somateria mollissima*
Walker (1812), referring to the 1760s, mentioned a 'large quantity' of nest-down being collected annually. Described as 'very plentiful' by Swinburne (1885) and 'common' by Harvie-Brown in 1887. More recent counts are usually estimates of pairs suggesting 20–60 pairs in the 1930s and 35–45 pairs in 1976, so it is hard to judge if there has been any substantial change in breeding numbers over this period. Thirteen nests were found in June 2012, a larger number than in earlier years e.g. nine in both 1986 and 2005 and seven in 1998. Offshore counts during the breeding season have varied little since the mid-1980s, with 55 males, 31 females and 29 ducklings in 1986, 48 males and 18 females in 2005, 50 males and 29 females in 2009 and 22 males and 33 females in 2013.

Flocks of 80–100 moulting birds are present in July and August and up to 100 birds are still present in October. Most birds leave in the winter but some have been recorded in November and March.

Velvet Scoter *Melanitta fusca*
Nine on 3 August 1938, two on 2 September 1938, up to three 28–30 October 1960 and a female ashore on 17 October 1981.

Common Scoter *Melanitta nigra*
Single 21 June 1980 and an immature 12–14 June 2012. A few October records. Maximum count six 24 October to 6 November 1960, single female found dead 24 October 1981.

Long-tailed Duck *Clangala hyemalis*
Low numbers recorded most autumns between October and December. Maximum of five on 29 October 1979, three on 15 October 1981.

Goldeneye *Bucephala clangula*
A few in October and November with a maximum count of four on 3 October 1959.

Goosander *Mergus merganser*
One found dead on 24 June 1958.

Red-breasted Merganser *Mergus serrator*
Single male on 11 May 2005. Single females on 23 May 2005, 30 June 2009, 4 July 1958 and two on 29 August 1931. Otherwise records in October with a maximum of 18 on 4 October 1962.

Nightjar *Caprimulgus europaeus*
Single on 17 June 2012.

Swift *Apus apus*
Low numbers recorded between June and October. Up to six on 30 July 1971, 16 July 1987 and 3 July 2009. Maximum 15 on 25 June 2001.

Cuckoo *Cuculus canorus*
Single juvenile on 10 August 1966.

Rock Dove/Feral Pigeon *Columba livia*
Rock Doves are present in variable numbers between May and July in some years. Breeding suspected but never proved. A maximum of 40 birds on 11 May 2005, eight 'pairs' 13–18 June 1998, 11 birds in June 2009, five in June 2012 and two in June 2015.

Migratory Rock Doves used to arrive in October with a few wintering. The autumn flock declined from 10–12 in the late 1950s to three or four in the early 1960s and none was recorded in 1967. A small number present from late September to early November 2005.

Feral or racing pigeons were first noted in 1967 and small numbers have been seen occasionally since then, mostly in summer and autumn.

Woodpigeon *Columba palumbus*
Singles on 13 October 1961, 9 October 1962, 2 July 1972, 24 June 1980, 12–18 June 1986, 17 June 1998, 5–10 June 2012 and 4 July 2017. Two recorded on 19 May 1987 and 31 May 2005.

Turtle Dove *Streptopelia turtur*
Seen regularly between June and November in earlier years, with a maximum of four on 28 June 1972. Since then singles on 26 June and 14 July 2001 and four birds 11 June 2011.

Collared Dove *Streptopelia decaocto*
First records were two on 30 June to 2 July 1972 and two on 14–15 June 1974. Ones or twos in very late May or June of nine years between 1976 and 2012, with three birds in June 1998 and four on 16 June 2005. Maximum 14 on 28 May 1977. Subsequently, two in mid-May 1985 and five on 1 July 2015.

Water Rail *Rallus aquaticus*
Autumn records of singles on 11 October 1959, 17 October 1961, 11 October 1962, 5 September and 23 November 1972. Single summer record on 7 June 2012.

Corncrake *Crex crex*
Singles on 17 October 1959 and 30 October 1960.

Crane *Grus grus*
Adult on 7, 17 and 18 June 2000.

Slavonian Grebe *Podiceps auritus*
Single on 11 October 1962.

Oystercatcher *Haematopus ostralegus*
Described as 'abundant and aggressive' in 1887 and many were seen by the Duchess of Bedford in 1910 and 1914. No more than 20 pairs have been recorded since and from 1976 onwards less than ten pairs. Breeding numbers are highly variable: one nest found and another pair on territory but not breeding in 1986, nine pairs bred in 2009, eight pairs in 2012, at least 12 pairs in 2015 although not all appeared to be breeding.

Migrants are most common between May and August, with flocks of more than 20 frequently recorded. Only a few stragglers are left by November or, exceptionally, December.

Lapwing *Vanellus vanellus*
Bred in 1958 when two pairs (one with young) were present and up to 13 birds were present later that season.

Recorded in small numbers, usually less than five, but mostly singles, in May, June, July and October of most years with a maximum of 22 birds in November 1938.

Golden Plover *Pluvialis apricaria*
Regular in all months between May and November, maxima of 40 in May and 35 in October. The northern and southern races have both been recorded.

Ringed Plover *Charadrius hiaticula*
Possibly breeding on 16 June 1885 although no eggs or young found.

Migrants recorded in small numbers between May and November, but 14 on 2 September 1931, 25 on 23 May 2005 and 15 on 2 July 2013.

Dotterel *Charadrius morinellus*
Single on 30 August 1938, four on 22 June 2001.

Whimbrel *Numenius phaeopus*
Breeding suspected but not proved on 16 June 1885.

Recorded regularly in low numbers between May and August, occasionally in October and November. Rarely more than five recorded at any one time but up to 25 on 23 May 2005.

Curlew *Numenius arquata*
Breeding suspected in 1883 (five or six pairs said to be present) and 1886 (one pair).

A single on 12 March 1986. Otherwise numbers typically build up from late May to a peak of sometimes 50 in August before tailing off in the autumn. Few records in November and none in December.

Bar-tailed Godwit *Limosa lapponica*
Singles on 22 October 1970, 15 and 18 September and 6 October 1972, and 20 October 1982.

Turnstone *Arenaria interpres*
Darling (1940) suspected breeding as he saw two adults and three recently fledged young on 12 July 1938, a date when immigration of a family group would appear unlikely.

Small numbers have been seen throughout the summer months and all are undoubtedly migrants, e.g. 20 on 2 July 2013, and up to eight present 21–30 June 2015. Occurs annually in autumn with peaks in September and October, usually not more than 100, but 300 were present on 5 September 1972 and in October 1967.

Knot *Calidris canutus*
One on 16 August 1938 and 'common' thereafter until the end of September that year. Singles on 14 and 19 October 1959 and 6–8 July 1980. Between two and six birds present between 13 October and 4 November 1972 with one on the 19th. Three on 26 July 1984, two 19–20 May 2004.

Ruff *Calidris pugnax*
Three females on 4 August 1980, one female on 31 July 1984, single on 12 June 2002.

Sanderling *Caiidris alba*
Singles on 31 August and 2 September 1931, in August and September 1938 and 1 June 1997. Two in summer plumage 15 August 1966, two on 4 June 1998, also on 30 May 1999 with eight on 6 June 2002.

Dunlin *Calidris alpina*
Possibly nesting on 18 June 1887. An adult in breeding plumage was alarm calling on 26 June 1976, but no nest was found.

Low numbers between May and October, generally peaking in late August/early September, 20 were present in November 1972.

Purple Sandpiper *Calidris maritima*
Recorded in all months between May and December. Maxima of 13 in spring/summer and 200 in autumn/winter, but counts usually of less than 80.

Little Stint *Calidris minuta*
One or two present on dates between late July and November in 1931, 1938, 1959, 1965 and 1972.

Buff-breasted Sandpiper *Tryngites subruficollis*
Single adult on 23–24 June 2001 and a juvenile 3 October 2001.

Woodcock *Scolopax rusticola*
Recorded between September and December but most regular in October. Usually single birds but ten on 20 December 1938.

Jack Snipe *Lymnocryptes minimus*
Recorded in low numbers from late September to mid-December with a maximum of 20 on 11–12 October 1959 and up to eight daily in October 2001. Also singles on 29 July and 3 August 1966.

Snipe *Gallinago gailinago*
Breeding 9 June 2012 when a nest with four eggs was found and three other pairs were present. Displaying birds noted in earlier years, but summer numbers clearly variable, with none present in June 2009.

Generally few records between May and September, with most occurring October to mid-November and maxima of 30 in most years.

Red-necked Phalarope *Phalaropus lobatus*
Singles on 9 October 1962 and 26 and 28 June 1972.

Grey Phalarope *Phalaropus fulicarius*
Single female close inshore on the west side of Fianuis, 23 May 2006.

Common Sandpiper *Actitis hypoleucos*
Recorded on 24–27 August 1936, two on 3–5 June 1958, singles on 22 October 1966 and 30 June 1972. Singles present 19 October 1971, 19 October 1972 and 14 August 1980.

Green Sandpiper *Tringa ochropus*
Singles on 29 August 1931, 24 September 1938, 3 August 1954, 4 August 1980 and 24 and 29 October 1981.

Redshank *Tringa totanus*
Low numbers present in spring, summer and autumn with maxima of 54 recorded in July

and 30 in October. Few left by mid-November although 25 present at this time in 1972.

Spotted Redshank *Tringa erythropus*
Single on 21–22 September 1938.

Greenshank *Tringa nebularia*
Singles on 31 August and 2 September 1931, 17 August 1938, 24 October 1981, 22 July 1991 and 23 May 2005.

Kittiwake *Rissa tridactyla*
Large colonies noted in the 1880s and estimates of 1,000 pairs were made in 1931 and 1936. An increase to 3,385 pairs had taken place by 1958 with numbers continuing to increase slowly thereafter, reaching a peak of 4,197 AON in 1993, declining to 2,913 AON in 1998, then increasing again to 3,398 AON in 2001. In 2005 there were 1,837 AON and since then the decline has been more pronounced with 987 AON in 2009, 923 AON in 2012, 630 AON in 2015 and 447 AON in 2021.
Seen offshore throughout the year.

Black-headed Gull *Chroicocephalus ridibundus*
The majority of sightings in July or October, except for September 1938 and an immature 5 September 1972. Maximum of 17 on 29 July 1974, otherwise usually singles. Few spring records (single 11 May 2005) and ones or twos in June 1986, 1993, 1998 and 2002, with four on 16 June 2012.

Common Gull *Larus canus*
Singles in October 1961, up to eight in October 1962. Since then three adults on 4 August 1980, three adults and an immature on 31 July 1984 and two adults 25 July 1989. No spring records but a single adult on 29 June 2009 and two 9–11 June 2012.

Great Black-backed Gull *Larus marinus*
Swinburne in 1883 mentioned a large colony at the south-west end and most visitors since have commented on their abundance. An accurate assessment of trends is difficult as most counts have been made late in the breeding season and confusion has arisen from the different counting units used. In 1969 and 1976 counts exceeded 1,500 pairs, with a maximum of 2,018 pairs in 1972. Most counts have been of AOT combined with nest counts, most often expressed as pairs. In 1986 there were 733 AOT and subsequent counts have charted a slow, and continuing decline. In 2001 the majority of chicks succumbed to cannibalism before fledging and breeding failures have been noted in subsequent years. In 2005, AOT combined with searches for nests gave an island wide estimate of 431 AON (551 if trace nests included). Between 3 and 5 June 2012, a count of all well-built nests on the island found 167, with an additional 24 estimated. The decline has continued with 47 AOT in 2021.

Numbers in the autumn are variable but sometimes numerous with more than 2000 in October 1981 and 500 in both October 1959 and 1960.

Glaucous Gull *Larus hyperboreus*
Up to six, including immatures, on 14 and 18 December 1938 feeding on the carcasses of young seals. An adult and first-winter bird on 22 October 1970, otherwise singles in October 1961, 1962, 1967 and 1981, with first-winter birds on 15 November 1972 and 29 September 2005. One spring/summer record of a dead adult found mid-June 1980.

Iceland Gull *Larus glaucoides*
Single immatures on 20 October 1967 and November 1972, a second-year bird 3–23 October 1981 and a single adult 11 May 2005.

Herring Gull *Larus argentatus*
Numbers have fluctuated with high counts in 1887, 1972 and 1976 and particularly low numbers in 1883, 1885, 1910–1938 and 1980. The highest count was 137 pairs in 1976, with numbers steadily declining since then: 1986 (69 pairs), 1998 (40 pairs) and 2005 (15 pairs). Only ten nests with eggs were found in June 2012 and there was a single AOT in 2021. It seems that currently the species is barely maintaining a breeding presence.

Low numbers present on and around the island throughout the year. Maximum count outside the breeding season 200 on 14 October 1961.

Lesser Black-backed Gull *Larus fuscus*
Past status is unclear as it appears to have sometimes been confused with Great Black-

backed Gull. It was described as plentiful in 1886 and the lower parts of the island were 'thickly covered' with their nests in 1910 and 1914. However, Swinburne and Harvie-Brown found either few or none during their visits in the 1880s. Not seen by Harrisson in 1931 nor Robson in 1966. The maximum count since then has been 12 pairs in 1976 and no more than six pairs in all other years. Although pairs or nests have been in single figures for many years, breeding has been regular, most recently in 2009 when two broods were found. No evidence of breeding in June 2012 when only three birds were seen. None was seen in 2015 or 2021.

Arctic Tern *Sterna paradisaea*

Breeding occurred regularly from 1885 to 1958 on either Fianuis or Sceapull but only intermittently thereafter. However, many visits may be too late in the season to prove breeding as in some years when breeding was proven in June, no birds were seen in July. A large colony was mentioned in 1910, with a maximum count of 200–300 pairs in 1938 but more recent counts of probable or confirmed breeding are much lower e.g. 28 pairs in 2005, up to 60 pairs at three sites, two on Fianuis and one on Sceapull in 2009. In June 2012 about 20 pairs were present at the extreme north tip of Fianuis and in June 2013, 2015 and 2016 up to 50 pairs were apparently breeding on Sceapull with 39 nests there on 5 July 2017. In 2021, at least 120 adults were estimated.

Great Skua *Stercorarius skua*

Recorded on 17 August 1938 but not again until 10 May 1959. The first two nests with eggs were found in 1965. Since then the number of breeding pairs has risen slowly, reaching 14 in 1986, seven of which had eggs. Most counts made since then have been of territories, and apart from 1986, systematic searches for nests are reported only for 1989 (20 pairs, 15 with eggs by 21 May), 1993 (18 pairs, 10 with eggs or young), 2001 (16 pairs, 7 with young), 2009 (18 pairs, 5 with eggs or young) and 2012 (31 pairs, 25 with eggs). Between these years AOT have been counted, but totals have never been higher than 20 (although 40 'nests' were reported in June 2005). It is unclear if there was a real increase between 2009 and 2012, or whether earlier counts underestimated numbers. In 2021, there was a minimum of 37 AOT.

A single bird on 5 September 1972

Pomarine Skua *Stercorarius pomarinus*

Single adult on 2 September 1931. One reported in May 2001 was later found dead and proved to be a light morph Arctic Skua with exceptionally elongated but not spatulate central tail feathers.

Arctic Skua *Stercorarius parasiticus*

Since the first sighting in 1958, seen regularly between May and July but no signs of breeding. Up to two in 1993, 1998, 2009 and 2012. One found dead June 2001.

Little Auk *Alle alle*

Dead birds on 6 November 1960 and mid-June 1980.

Guillemot *Uria aalge*

Large numbers breeding since at least 1885. The first whole island count was 6,810 birds in 1969. Numbers then steadily increased, peaking at 17,104 individuals in 1986, then declined to 10,497 individuals in 1998, 6,113 individuals in 2005 and 4,961 individuals (with few birds with eggs or young) in 2012. By 2015 numbers had increased slightly to 5,741 birds but only 1,833 were counted in 2021. Thus, the population has shown a dramatic decline, at a rate of 6% per annum since 1986, The proportion of the bridled morph in the population has remained at about 13% since 1885, with the most recent check on 14 June 2012 indicating a frequency of 15%.

Winter attendance at the colony was noted on 3 December 1972 when over 100 birds were ashore.

Razorbill *Alca torda*

Early naturalists described the species as 'abundant', 'fairly numerous' and a 'very fair colony'. Later estimates have suggested up to 2,000 individuals, but accurate counts of individuals requiring repeated visits to both known and likely breeding sites have only been made in four years: 1,236 individuals in 1986, 824 individuals in 1998, 543 individuals in 2005, and 513 individuals in 2012. The counts made in 1986 and 2012 are the most comparable in coverage, and suggest a major decline between

these years. The 1998 count was described as a 'slight underestimate', so it is likely that the decrease in breeding birds has occurred since 2000. Further evidence for a decline comes from counts at the largest and most easily viewed colony on the west side of Geo Léis, where there were 186 individuals in 1986, 122 individuals in 1993, 123 individuals in 1998 and 71 individuals (the highest of five counts made on different days) in 2012. However, a single count of 101 birds made here in 2015, and an island-wide count of 540 birds suggested the population might then have stabilized. In 2021 there were 328 individuals on the island. Leaves the island by early August and Robson (1969) noted parents abandoning late chicks in 1966.

A single bird present on 17 November 1972.

Black Guillemot *Cepphus grylle*

Present in 1883 and breeding in the village in 1886. Since 1931 the breeding population has never exceeded 20 pairs. A partial offshore count on 18 April 1986 found 56 birds, and incomplete coverage on 11 April 2001 found 23 birds close to shore. Estimates rather than counts made in June in several years suggest a breeding population of about 20 pairs. A single bird was seen in 2021. Nests have been found regularly along the west coast from Geo an Tuill to Sceapull, with a maximum of seven in 1986 and four in 2009. Birds have also been seen off the south and east coasts so breeding here seems likely. Counts are too few to be certain of the population trend, but similar June counts suggest a stable breeding population.

Puffin *Fratercula arctica*

The population almost certainly declined sometime after 1883 when Swinburne (1895) described them as 'swarming wherever they could burrow', but to what extent is unknown. Numbers and distribution are uncertain before 1958, when 8,000 pairs were estimated and the first map of the colonies drawn. The colony was mapped again in 1972, 1986, 1993 and 2001 and showed noticeable decreases along the west coast. However, the main colony on the east cliffs (Plates 17 & 18) maintained its numbers,

Plate 17. The steep cliffs below the lighthouse on Toa Rona summit holds the largest colony of Puffins on North Rona, 30 June 2017. © *Stuart Murray*

Plate 18. The dense Puffin colony on the steep slope of Toa Rona viewed from just below the lighthouse, 11 June 2011. © *Stuart Murray*

Plate 19. The southern half of Fianuis from the air. The light coloured area fringing the right hand edge of the grass is the so-called storm beach that holds the largest sub-colony of Storm Petrels on North Rona. However, both small petrels also breed in ruined walls and bothies elsewhere on Fianuis, 30 June 2017. © *Stuart Murray*

with substantial increases between 1976 and 1993 but no expansion of colony limits. Overall, despite some peripheral losses of isolated sub-colonies there is nothing to suggest that a wider decline had occurred. In 2015 localised increases were noted along the upper edge of the east cliffs and three occupied burrows were found at the top of Fank Brae and two at Cladach Crò Iain Dheirg. The latter two are sites where breeding was last recorded in 1986. A survey of the colony at the east side of Fianius in 2021 found 467 AOB while 2,780 individuals were counted elsewhere around the island.

Red-throated Diver *Gavia stellata*

Singles on 6–15 October 1962 and 24–27 June 2015.

Black-throated Diver *Gavia arctica*

Single on 10–12 October 1959, two on 27 October 1960.

Great Northern Diver *Gavia immer*

Up to two present 28–31 October 1960, otherwise singles on 19 and 29 October 1961 and 19 May 1987. A summer plumage adult was present on 4 June 2012 and a winter plumaged bird on 2 July 2013. A diver, probably of this species, was seen on 30 June 1972.

Storm Petrel *Hydrobates pelagicus*

Harvie-Brown discovered this species when he dug out two birds from the village ruins in 1885 (Harvie-Brown & Buckley 1888). Over the next half-century the species was found nesting in most parts of the island. The breeding distribution is much the same today with the largest colony in the storm beach on Fianuis (Plate 19). In 1886 Barrington (in Harvie-Brown 1886) described 'hundreds churring under stones'. Harrisson (1932) made the first estimate of the population, '80 or more pairs', in 1931. J.M. Boyd, during a short visit in early June 1958 estimated 1,000 pairs in the storm beach alone, but P.G.H. Evans in 1972 considered 1,000 pairs to be the upper limit of the island population, with the storm beach holding the largest numbers. An island-wide survey using tape-playback made in 2001 found 362 AOS. A repeat count in 2009 found 358 AOS suggesting that the population was stable. Some adults and young are still present in late October with one recorded on 26 November 1972.

Leach's Petrel *Oceanodroma leucorhoa*

Swinburne (1885) discovered this, then the second known British colony, in 1883 when he dug out 23 nests from the village ruins. In 1885 Harvie-Brown dug out 24 but returning in 1887 he, perhaps not surprisingly, found them more difficult to find. The first island estimate of 120 pairs, was made by Harrisson in 1931, followed in 1936 by Ainslie and Atkinson who suggested a total population of 380 pairs, of which 327 were in the village. In 1958, Bagenal and Baird (1959), using ringing and retrapping estimated the island population to be about 5,000 pairs.

However, this method captures non-breeding birds as well as breeders and so gives markedly higher estimates than those derived from counts of occupied nest sites. In 1972 P.G.H. Evans estimated the entire population, including that of the village, at 500 pairs.

Comparable island-wide surveys were made in 2001 and 2009 using tape-playback for the first time. The population had declined by 34% from 1,084 AOS in 2001 to 713 AOS in 2009. A repeat survey in 2015 found a further decline to 606 AOS. The majority of the losses were in the village sub-colony whereas elsewhere there had been some small increases. These results suggest that Leach's Petrel is not so severely threatened across North Rona as once thought, although continuing declines in the sub-colony in the ruined village are concerning. Some late breeding adults and near-fledged young are present until mid-October.

Fulmar *Fulmarus glacialis*
Fulmars were first recorded in 1886 but not proved to breed until an egg was found in 1894. A substantial increase had taken place by 1907 when the Duchess of Bedford found a great many breeding and in 1910 inland nesting was first noted. An island wide count made in 1931 recorded 600 pairs. There appeared to be little change in numbers from then until at least 1949, after which there was a steady increase (2,166 pairs in 1958) up to the population peak in 1972, of 4,141 AOS. Each count since has seen a reduction in numbers: 3,738 AOS in 1986, 3,520 AOS in 1998, 2,616 AOS in 2005, 1,438 AOS in 2012 and 1,204 AOS in 2021. The counts are of both coastal and inland areas, the latter being principally the storm beach and Fianuis, Buaile na Sgrath and the village ruins. The numbers breeding among the ruins have decreased steadily over the years. The highest counts of young have been 45 in 1971 and 32 in 1972, down to 11 in 2001, seven in 2009, five in 2012 and six in 2016. The reduction in breeding numbers in the village, taken together with the series of whole-island counts, leaves little doubt that overall the species has been in steady decline since 1972.

Large numbers are present intermittently throughout the winter and blue-phase birds from the Arctic have been noted on a number of occasions.

Sooty Shearwater *Ardenna grisea*
Occasionally offshore in late summer/autumn, usually single birds but 625 were counted around the island in late September 1993.

Manx Shearwater *Puffinus puffinus*
Only report of a bird onshore is one found long dead 21 June 1986. Few seen regularly from the island between May and August and one on the late date of 11 November 1972.

Gannet *Morus bassanus*
Regular offshore throughout the year.

Cormorant *Phalacrocorax carbo*
One or two immatures between 30 August and 2 September 1931. Singles on 27 May 1965, 14 June 1969 and 28 October 1979. Present on 10 June 1976 and at intervals between late September and early November 2007, single adults on 10 June 2012 and 22 June 2015.

Shag *Gulosus aristotelis*
First noted in 1883 by Swinburne and described as 'innumerable' by Harvie-Brown in 1885. Since then most visitors have found them common and have made similarly vague population estimates. The first whole-island count of nests appears to have been 117 in 1972. Subsequent counts were 143 AON in 1986, 156 AON in 1998 and 21 AON in 2005. The 1998 total, although the highest recorded, was regarded as a minimum since nests in sea caves were not counted. However, the very

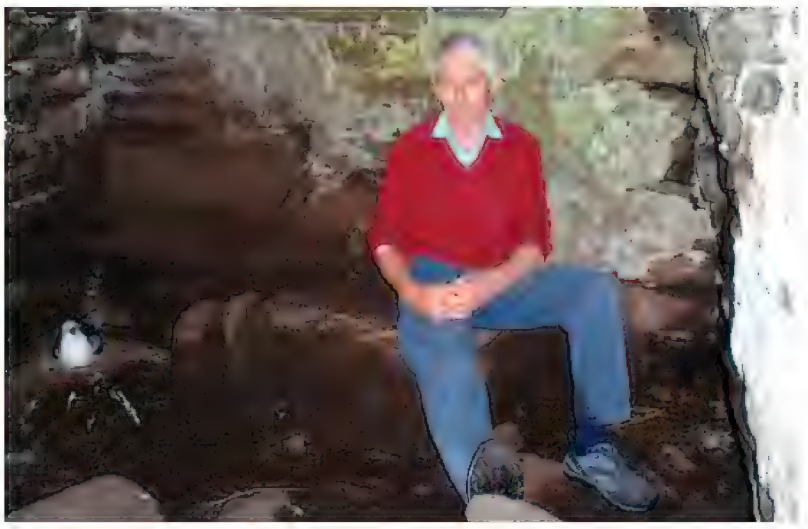

Plate 20. Stuart Murray and a nesting Fulmar inside St Ronan's cell. Throughout most of the 20th century up to four pairs of Fulmars bred in the cell, one in each corner. However, since the 1990s numbers have dwindled to a single pair, always nesting in the same site adjacent to the altar, 11 June 2011. © *Jill Harden*

low count in 2005, also excluded sea caves. It seems a large-scale population crash or a non-breeding event took place that year, or perhaps earlier, with numbers slowly recovering since 83 nests were found, including those in sea caves in 2012. Sixty-seven nests were found outside the sea caves in 2015, which suggested little overall change since 2012. There were 40 nests in 2021.

Birds are present throughout the year. Up to 200 were present each October between 1959 and 1967, more than 300 were counted on 27 October 1981.

Grey Heron *Ardea cinerea*
Seen in all months between June and October, most often in October. Maximum of seven on 14 September 1972, 'several' present 17–18 June 2000 and four on 26 June 2001. One found dead 19 May 1987.

Sparrowhawk *Accipiter nisus*
Two on 11 October 1979 with one remaining until 3 November, one in late autumn 2007.

Hen Harrier *Circus cyaneus*
Singles between 29 August and 3 September 1931, most of September 1938, 9 October 1962. Single on 7 October 2001 with two on the 8th.

Black Kite *Milvus migrans*
Single on 26–28 June 1976.

White-tailed Eagle *Haliaeetus albicilla*
Sub-adult photographed 1 June 2022.

Buzzard *Buteo buteo*
One September to December 1938 and one dead on 7 October 1959.

Snowy Owl *Bubo scandiaca*
Single present for 10 days in October 1994.

Long-eared Owl *Asio otus*
Singles on 18 December 1938, 17 October 1964 and 24 October 1966.

Short-eared Owl *Asio flammeus*
Recorded from August to 9 December, with most records in October. All singles except two on 27 October 1960 and 14 October 1962. Only spring record two on 23 and 31 May 2005.

Great Spotted Woodpecker *Dendrocopos major*
One on 11 October 1962 and a first-year bird 20 October 1968.

Kestrel *Falco tinnunculus*
Seen in all months between August and December with most sightings in October, rarely more than one present.

Merlin *Falco columbarius*
A regular autumn migrant with most records in October. Peak autumn counts of 15 birds on 7 October 1962 and up to three between 25 September and 10 November 2001, with the latest date at the end of November in 1972. Few spring records, the most recent being single females on 11 and 23 May 2005.

Peregrine *Falco peregrinus*
Probably used to breed since alarming pairs were present in the summers of 1883, 1887 and 1938. The last confirmed spring or summer record was in 1938 and the species became an irregular autumn visitor or migrant. The last record is a single on 24 October 2001.

Red-backed Shrike *Lanius collurio*
Female on 28 May 1977, male 31 May 2005.

Plate 21. Snowy Owl on Fianuis, North Rona, October 1994. © *Paddy Pomeroy*

Great Grey Shrike *Lanius excubitor*
Single on 11 October 1962.

Golden Oriole *Oriolus oriolus*
Female or first-summer male on 21–23 June 1986.

Jackdaw *Coloeus monedula*
Up to eight late October 1960, and one on 9 October 1962. Singles 28 and 30 June and 5–9 July 1972, also 25 May 2008.

Rook *Corvus frugilegus*
Single on 20 October 1961.

Carrion Crow *Corvus corone*
Singles on 6 June 2002 and 23 May 2005.

Hooded Crow *Corvus cornix*
No evidence of breeding. Recorded summer/autumn 1914, 1959–63, 1968–1972, 1976, 2000 and 2012. Most records of single birds but a 'pair' was noted June 2002.

Raven *Corvus corax*
First recorded on 19 December 1938. Bred in 1958, 1977, 1980 and 1986 and possibly 1954, 1959, 1972, 1987 and 1990. Birds appear to be resident having been recorded up to 18 December, but appear not to nest every year.

Waxwing *Bombycilla garrulous*
About 20 on 9–10 October 1965 and one 19 November 1972.

Skylark *Alauda arvensis*
First confirmed breeding in 2001 when a nest with eggs was found and a second pair was singing. A pair in 2009 and two pairs in 2012 probably bred but there was no direct evidence. Two singing males in 1998 and 1999 also suggest breeding.

Up to 20 per day during October in the early 1960s, but recorded in only six autumns between 1967 and 1986 with a maximum of at least 15 on 22 October 1970. Latest date 10 November 2001. Few other spring records but eight on 3 June 2005.

Shore Lark *Eremophila alpestris*
Up to three together 9–24 October 1981. Single female on 23 May 2005.

Short-toed Lark *Calandrella brachydactyla*
Single on 8 June 1999.

Sand Martin *Riparia riparia*
Two on 28 May 1977 and 11 June 2011. One 31 May 2005.

Swallow *Hirundo rustica*
Frequently in small numbers in May, June and July, with peaks of 11 on 15 June 1986 and 20 on 3 June 2005. Rarely recorded in autumn (single on 5 October 1962).

House Martin *Delichon urbica*
Regular in small numbers during the spring and summer with peaks of 10 on 28 May 1977 and six on 3 June.

Willow Warbler *Phylloscopus trochilus*
Up to five on 2–3 September 1931. Singles 7, 8 and 20 October 1959, 14 October 1961 and 15 October 2001. Up to two 17–18 October 1964 and 26–28 September 1972, singles 18 June 1986 and 4 June 1998, two (or more) 23 May 2005 and 25 May 2008.

Chiffchaff *Phylloscopus collybita*
Singles on 1 and 3 September 1931 and 14–15 October 1961. Four on 23 May 2005 and singles in June 2012 and 2015.

Willow Warbler or Chiffchaff reported seven dates in autumn, once in September, otherwise October. Spring records during fall of migrants on 28 May 1977, and 23 May 2005.

Wood Warbler *Phylloscopus sibilatrix*
Singles on 7, 8 and 20 October 1959, 29 June 1974 and 28 May 1977.

Yellow-browed Warbler *Phylloscopus inornatus*
Single on 18 October 1964.

Sedge Warbler *Acroephalus schoenobaenus*
Single on several dates in October 1981.

Icterine Warbler *Hippolais icterina*
Single on 23 May 2005.

Blackcap *Sylvia atricapillas*
Regular most Octobers in small numbers, also singles mid-May 1985, 14 July 2001 and 6 June 2002.

Garden Warbler *Sylvia borin*
Recorded in October 1959 and occasionally in the early 1960s. Three on 9 October 1962, singles 15–16 September 1972, 3 August 1980, 24 June 2001, 12 June 2002 and 21 June 2015.

Barred Warbler *Curruca nisoria*
Singles on 1 and 3 September 1931, 8 August 1936 and 20 October 1961. The first was shot to confirm its identity. Harrisson graciously wrote that he did not consider it necessary to shoot the second example. Singles also 9 October 1962, 30 May 1999 and 23 May 2005.

Lesser Whitethroat *Curruca curruca*
Singles on 1 and 3 September 1931.

Whitethroat *Curruca communis*
Two on 28 June 1981, single 23 May 2005.

Goldcrest *Regulus regulus*
Singles on 16 June 1974 and 30 October 2001.

Wren *Troglodytes troglodytes*
Present each October and some Novembers 1959, 1960, 1962, 1964 and 1965. Only records since are singles on 22 October–7 November 1979 and 5 October–1 November 1981. Rare in other months with only three records: singles on 19 May 1987 and 11 May 2005, two 18–19 June 1993.

Starling *Sturnus vulgaris*
Present since at least 1910 and breeding since 1914, mainly in the village. Small numbers also nest in the storm beach, elsewhere on Fianuis and on cliff sites, including Toa Rona. One hundred pairs estimated in 1958 but counts in other years much lower.

Regular summer flock of 200–300 birds, though over 500 have been seen on occasions. Passage noted in mid-October 1961.

Ring Ouzel *Turdus torquatus*
One or two on 10–14 October 1959 and 18–22 October 1968, singles 9 October 1962, 17 October 1981 (recently dead), 29 September and 1 October 2001. A single on 28 May 1977 is the only spring record.

Blackbird *Turdus merula*
A regular autumn migrant with some birds staying into December. Peak counts of 500 on 2 November 1960, 'hundreds' recorded in 1965 and 500+ in October 2001. Very few spring or summer records, present in ones or twos on 10 and 26 June–3 July 1976, 15 June 1986 and 9–16 July 2001.

Eyebrowed Thrush *Turdus obscurus*
Single on 16 October 1964 was the 3rd British record.

Fieldfare *Turdus pilaris*
Recorded every autumn, occasionally in large numbers with 500 present between 17 October and 2 November 1959 and 16 October to 2 November 1960, about 300 on 30 October 2001. A single on 16 June 1974.

Redwing *Turdus iliacus*
Recorded between September and December but numbers always highest in October when the species is the commonest migrant on the island. About 1,000 estimated on 17–18 October 1959, 9 October 1962 and 30–31 October 2001.

Song Thrush *Turdus philomelos*
A few during some autumns with other thrushes. Rarely more than 20, as on 20 October 1961, but 10 to 20 daily between 1–14 October 2001, with over 100 on 15th. Spring records of a single on 30 May 1999, and 'several' 25 May 2008.

Spotted Flycatcher *Muscicapa striata*
Up to two on 6–12 October 1962. Singles 28 May 1977, 23 May 2005, 10 June 2012 and 22–26 June 2015.

Robin *Erithacus rubecula*
Small numbers in most Octobers with maximum of four in 1961. Only summer record on 4 June 1998.

Bluethroat *Luscinia svecica*
Single on 15–16 October 1981.

Red-breasted Flycatcher *Ficedula parva*
Singles on 10–13 October 1959, 18 October 1964 and 4 June 1998.

Pied Flycatcher *Ficedula hypoleuca*
One on 31 August 1931, two 6 October 1959 and one 14 and 15 October 1959. Singles 9–20 October 1962 and 19 September 1972.

Black Redstart *Phoenicurus ochruros*
Single birds on 1 November 1963 and 16 June 1986.

Redstart *Phoenicurus phoenicurus*
Regular in October from 1959 to 1967 but no records since.

Whinchat *Saxicola rubetra*
Singles on 29 and 31 August 1931, 9 October 1962 and 10 October 1964. Two 25 June 1972, with one to 1 July 1972. Also a single summer record (date uncertain) in 1999.

Stonechat *Saxicola rubicola*
Single male on 23 and 31 May 2005.

Wheatear *Oenanthe oenanthe*
Nested, or probably nested, in 14 years between 1883 and 1990, with generally less than five pairs in any year. Small numbers occasionally present in June and July, most recently in 2009, 2012 and 2015 but no evidence of breeding.

Migrants recorded May to October with numbers peaking from August onwards. Peak counts of over 100 on 11 May 2005, 'hundreds' on 25 August 1910 and 150 on 9 October 1962. Birds of the larger Greenland or Iceland race *O. o. leucorhoa* are probably regular but under recorded, 20 were noted in May 1959.

House Sparrow *Passer domesticus*
Up to six daily on 3–26 October 1959, a female 13–14 October 1961 and one bird 28 October 1972.

Tree Sparrow *Passer montanus*
Five seen at the end of June 1886 when thought to be breeding.

Recorded regularly in October in the early 1960s, with maximum of 12 in 1960. One long dead in June 2009.

Yellow Wagtail *Motacilla flava*
Single female on 29 June 1886, three on 31 August 1931 and an immature 18 October 1964, two 25 May 2008.

Grey Wagtail *Motacilla cinerea*
Single 9–10 October 1962 and 8 and 18 September 1972.

White/Pied Wagtail *Motacilla alba*
Large passage of White Wagtails *M. a. alba* during August and September with up to 150 recorded in 1936, also regular in May and October but in lower numbers. A few Pied Wagtails *M. a. yarrellii* recorded e.g. one on 15–16 June 1998 and two 21–23 June 2015.

Meadow Pipit *Anthus pratensis*
First recorded in small numbers in 1883 and by most visitors in the summer since then. Breeding proved in 1931 (3–5 pairs), 1958 (10–12 pairs), 1972 (3 pairs), 1984 (1 pair) and 1998 (5 pairs) but no resident birds seen in 1936 or 1976.

Migrants regularly noted in spring, with peaks of over 100 on 11 May 2005 and 200 on 23 May 2005. Also recorded early August onwards with 'hundreds' on 25 August 1910, 'at least 500' on 2–3 September 1931 and 500 on 16–18 October 1959.

Tree Pipit *Anthus trivialis*
At least two between 31 August and 2 September 1931, singles 22 October 1965, 23 May 2005 and 25 May 2008.

Red-throated Pipit *Anthus cervinus*
Singles 4 June 1998 and 30 May 1999.

Rock Pipit *Anthus petrosus*
First noted in 1886. 'Scarce' in 1887 but numerous in 1910. Since then usually between 20 and 50 pairs, but may have declined in the 1970s with 20 pairs on territories in 1972, 14 pairs in 1976 and six pairs in 1980. However, numbers increased to 20 territorial pairs by 1987. In 2001 24 territories plotted around the coast and similar numbers were found in 2009 and 2012.

Migration observed in August, September and October. Generally less than 50 but over 100 were recorded 17 and 18 October 1960.

Chaffinch *Fringilla coelebs*
Recorded regularly in October during 1959 and throughout the 1960s. A maximum of 12 in 1959, a male on 6 November 1979 and a female on 29 May 1987 are the only records since.

Brambling *Fringilla montifringilla*
Recorded regularly in most Octobers with over 50 on 17 October 1959, 33 on 23 October 1965 and 40 in October 2001.

Bullfinch *Pyrrhula pyrrhula*
Singles on 27 and 30 October 1960.

Trumpeter Finch *Bucanetes githagineus*
Male on 25 May 2008 was the 4th Scottish record.

Common Rosefinch *Carpodocus erythrina*
Female on 28 May 1977.

Twite *Linaria flavirostris*
Low numbers recorded October 1960, 1961, 1964 and 1965, with a maximum of three on 13 October 1964.

Linnet *Linaria cannabina*
Two on 20 October 1982, 11 on 19 May 1987 and one on 23 May 2006.

Common Redpoll *Acanthis flammea*
Recorded most Octobers between 1959 and 1965 with a maximum of 20. Singles on 28 May 1977, 30 May 1999, 11–14 July 2001, 11 May 2005 and 3 July 2015. Some specific identifications uncertain but most records refer to Common Redpoll. However, Lesser Redpoll *Acanthis cabaret* may have been overlooked.

Parrot Crossbill *Loxia pytyopsittacus*
Up to two on 9–11 October 1962.

Crossbill *Loxia curvirostra*
Thirty on 29 July 1927 and one 26 July 1936, up to 51 in June–July 1972, four 26–27 July 1990, present 24 June–16 July 2001 (maximum 79 on 8 July), at least 100 on 27 June–10 July 2009 and two on 2 July 2013.

Siskin *Spinus spinus*
Up to five 13–20 October 1961, one or two 9–14 October 1962 and four 3 October 1981. One spring record of two birds on 3 June 2005.

Lapland Bunting *Calcarius lapponicus*
Recorded most Octobers with a few staying into November, maximum 20 on 6 October 1962. Only spring record a male on 3 June 2005.

Snow Bunting *Plectrophenax nivalis*
Recorded regularly each September to November, with peak counts of 200 on 13–14 October 1961, more than 100 on 10–14 and 18 October 1959, about 100 on 19–20 October 1968, 100 on 22 October 1970 and 70 on 29 September 2001. Few spring records: single males present 28 May 1977 and mid-May 1986, up to four on 23 and 31 May 2005, single 15 June.

Rustic Bunting *Emberiza rustica*
Male on 6–7 June 2002.

Black-headed Bunting *Emberiza melanocephala*
Male on 16 June 1998. Potentially an escaped cage bird, but date accords well with timing of majority of previous Scottish records (Forrester *et al.* 2007).

Records not accepted by British Birds Rarities Committee or probable escapes

Great Snipe *Gallinago media*
Singles on 19 December 1938 and 29 October–4 November 1979.

Black-eared Wheatear *Oenanthe hispanica*
Male on 15 June 1998.

Arctic Redpoll *Acanthis hornemanni*
Singles on 13 October 1972 and 7 October 1981.

Red-headed Bunting *Emberiza bruniceps*
Male on 25–28 June 1958. Species categorized by BBRC as escaped cage bird.

Birds of Sula Sgeir

Pink-footed Goose *Anser brachyrhynchus*
Two attempted to land on 8 May 2007.

Whooper Swan *Cygnus cygnus*
One long dead 15 June 1985.

Eider *Somateria mollissima*
Present 1549 and the late 18th century. A nest with four eggs in 1883, breeding in limited numbers in 1887 but no record since then of either birds or nests.

Swift *Apus apus*
Singles on 24 July 1991 and 23 May 2006.

Rock Dove/Feral pigeon *Columbia livia*
Ten recorded from a ship offshore on 3 June 2005.

Collared Dove *Streptopelia decaocto*
Single on 16 June 1986.

Oystercatcher *Haematopus ostralegus*
No evidence of breeding.

Singles on 3 August 1939 and between 13 and 31 August 1954, with two on 16 August 1954.

Whimbrel *Numenius phaeopus*
Singles on 3 August 1939 and 15 June 1993. One dead 13 June 2012.

Curlew *Numenius arquata*
Single on 3 August 1939 and up to 12 mid-August 1954.

Turnstone *Arenaria interpres*
Maximum of 22 on 13–31 August 1954 and 45 on 2 August 1980. No more than five recorded in other years.

Sanderling *Calidris alba*
Single on 2 August 1980.

Dunlin *Calidris alpina*
Singles on 14 May 2006, 18 August 1954 and 2 August 1980.

Purple Sandpiper *Calidris maritima*
Single on 2 August 1980.

Redshank *Tringa totanus*
Two on 13–31 August 1954, one on 18 August 1986.

Greenshank *Tringa nebularia*
Singles on 16 August 1954 and 23 May 2006.

Kittiwake *Rissa tridactyla*
Present in large numbers since at least 1883. Few estimates of the population made although a large increase apparently took place between 1932 and 1937. No change in numbers between complete counts in 1972 (1,038 pairs) and 1986 (1,031 AON counted with an additional 35 estimated) and little change in colony distribution. Numbers peaked at 1,206 AON in 1998 but only 348 AON were found in 2012. The decline continued with 265 AON in 2021.

Great Black-backed Gull *Larus marinus*
First noted breeding in 1939 but no counts until 1972 when 46 pairs were recorded. Numbers subsequently declined with only 3 pairs in 1986. Present 2009 and 2012 but no counts made. Two AOT in 2021.

Herring Gull *Larus argentatus*
Present since at least 1939 and breeding proved in 1971. Fifty-four pairs in 1972, 20 pairs thought to be nesting in 1986 and 1990. Several pairs, some with young, near the bothies in 2009. One AOT in 2021.

Lesser Black-backed Gull *Larus fuscus*
No evidence of breeding with the only records being birds present on 24 June 1971 and two birds on 7 July 1972.

Arctic Tern *Sterna paradisaea*
Two birds on 3 August 1939 (no sign of breeding) and five unidentified terns in mid-May 1985.

Great Skua *Stercorarius skua*
First recorded in 1980 when two present on 23 June. Single birds in mid-May 1985, 15 June 1985, 16 June 1986 and 18 August 1986. Seen harrying Gannets close to shore in 2009, 2012 and 2016.

Arctic Skua *Stercorarius parasiticus*
Singles on 29 June 1958 and 19 June 1993.

Guillemot *Uria aalge*
Breeds on the cliffs, among the Gannets and under boulders. Counting individual birds on the cliffs is possible but entering the colony to count among the nesting Gannets would cause unacceptable disturbance to both species and it is difficult to assess numbers where birds nest in boulders. All estimates of numbers must therefore be treated with caution. Described as plentiful in 1883 and still very common in 1932 and 1937. The first complete island count of 9,263 birds, was made in 1972 on the late date of 7 July by which time many chicks could have fledged.

Plate 22. Dense Guillemot colony on the headwall of Bealach an t-Suidhe on Sula Sgeir, 13 June 2012. © *Stuart Murray*

A count on 16 June 1986 recorded 25,382 birds and in June 1998 a whole island count gave 20,877 birds. A partial island count on 13 June 2012 found 16,149 birds.

A count made from aerial photographs taken on 30 June 2017 estimated a total of 14,475 individuals. Assuming that in boulder areas there were as many birds out of sight as were visible, a maximum estimate of 16,000 seems reasonable. Without ground checks this is probably the best available method of estimating the size of this population. Although the counts are not strictly comparable, the aerial counts of two areas gave surprisingly similar totals to the 2012 land counts - 2,518 in 2017 and 2,545 in 2012, and 1,156 in 2017 and 1,059 in 2012, respectively, suggesting that the species was not in serious decline. A field visit in 2021 reported at least 5,874 individuals.

Checks in 1958 and 1972 estimated that the frequency of bridling was 19.5% and 17.5% respectively.

Razorbill *Alca torda*

The species breeds in cracks and under boulders making accurate counts or even estimates difficult. It was described as abundant in 1887 and large numbers were noted in 1932 and 1958. The only complete counts are of 913 individuals in 1972 and 580 individuals plus an estimated 210 in the gannetry in 1986. There are no subsequent counts but recent estimates made by visitors have suggested a population of about 1,000 birds. However, only 68 birds were counted in 2021.

Black Guillemot *Cepphus grylle*

No evidence of breeding.

Three individuals on 7 July 1972 and recorded as present on 26 July 1969 and 28 June 1981.

Puffin *Fratercula arctica*

In 1883 Swinburne thought that numbers were comparable to the North Rona colonies and the species was still very common in 1932. Stewart on a late visit in 1937 found very few and little soil left in which they could burrow, whilst in 1939 Ainslie and Atkinson thought the only place left for Puffins to nest was under boulders. Soil must has built up on parts of the island since then but much of the ground is now occupied by Fulmars which might prevent Puffins from recolonizing. An estimate of 500–1,000 pairs was made in 1980 with a few birds breeding in the wall of the largest bothy. In 1986 and 2001 breeding was noted in the same areas as 1980 (including the bothy wall) and the minimum population estimate of 500 pairs was unchanged since 1980. Fifty-four birds were counted in 2021.

Black-browed Albatross *Thalassarche melanophris*

Single adult ashore near the lighthouse 25–31 August 2005 was the 5th Scottish record. Subsequently seen 23 May–1 July 2006 and 8 May–3 June 2007.

Storm Petrel *Hydrobates pelagicus*
Only recorded in 1930, 1954, 1958, 1959 and 1986. However, most visits have been during the day when these nocturnal birds could be overlooked. None recorded on a night visit in June 1980 and only one was caught during an hour's mist netting in June 1958, although others were heard calling. The most recent survey in 2001 using tape recordings to elicit a response from breeding birds found only eight but the ground search was limited to the bothies and immediate area.

Leach's Petrel *Oceanodroma leucorhoa*
First recorded in 1932 but not proved to breed until August 1939 when Atkinson uncovered small chicks. He made an overnight search and found adults calling from underground among the bothies south along the ridge to the summit of the rock. He considered the population to be as least as large as that on North Rona, estimating it at c.400 pairs. In contrast to the present day, the area then was largely unused by Gannets and Fulmar numbers were much lower. Given the present high densities of both species, it is unlikely that small petrels can breed among them. In 1954 MacGeoch (1954) could only find a dozen birds although he searched for several nights. Eighteen birds were caught in one hour's mist netting in June 1958. The most recent surveys using tape recordings to elicit a response from breeding birds found five in 2001 and none in 2009, but the ground search was limited to the bothy area.

Fulmar *Fulmarus glacialis*
Fisher (1952) mentions an unsubstantiated report by Fielden prior to 1850 and Muir noted them on his visit in 1860, which was some years before they were seen anywhere in Britain outside St Kilda. They were seen by Harvie-Brown in 1887, though breeding was not confirmed until 1932 when fewer than 150 pairs were present. However, there had been only one visit in the intervening years. A large increase had clearly occurred by 1939 when Atkinson counted 610 chicks for the whole rock and the increase continued to 1954 when MacGeoch counted 1,621 chicks including 15 on Lunndastoth The rate of increase (from 1860) had been about 8% per annum but the lack of comparable later counts makes it impossible to be certain of recent changes.

A count was made from aerial photographs taken on 15 July 1985 as part of the 1984/85 Gannet Survey (Murray & Wanless 1986). A total of 6,532 birds was counted, with a further 20% (1,300 birds) estimated to be in hidden areas. Lloyd *et al.* (1991) took these figures as pairs/occupied sites. No counts were made for Seabird 2000 (Mitchell *et al.* 2004) and an attempt was therefore made to survey the species on 26 May 2004, as part of the Gannet Survey (Murray 2005). The slides taken were carefully examined and some preliminary counts made. However, when the same areas were compared from different angles, more birds were visible in slides taken from the east compared with those from the west. This was due to the greater distance offshore when flying down the west coast, it being considered too dangerous to fly low over the nesting birds. Together with an earlier assessment of the breeding density and distribution of the colony made during a land visit on 19 May 2004, the photographs suggested that there had been no major changes over 20 years and the population remained in the region of 5,000–7,000 AOS. A land count immediately after Guillemots had finished nesting was recommended as the best method of obtaining an accurate colony count of breeding Fulmars on Sula Sgeir but this remains to be done.

Subsequent visits up to 2012 noted that breeding in the area from the bothies to the edge of the gannetry remained at a very high density. A total of 1,006 AOS was counted in this area in 2021.

In 1954, MacGeoch ringed 1,014 chicks, seven of which were recovered within six months, as far apart as Orkney, the Faroe Islands, Devon, Germany and Newfoundland. Birds have subsequently been recovered from Norway, Ireland and France.

Sooty Shearwater *Ardenna grisea*
One flying close to the rock on 18 August 1986.

Manx Shearwater *Puffinus puffinus*
No records on land. Twenty seen at dusk on the sea 3 km south of the rock on 15 June 1986, four flying east 28 June 1981.

Gannet *Morus bassanus*

In 1703, Martin (1716) reported Gannets inhabiting the rock but Monro (1774) suggested the gannetry was already in existence by 1549. In 1883, Swinburne (1885) considered there were 7,000 pairs. Numbers then fell. In 1932 Stewart (1938a,b), who stayed on the rock for 36 hours on 23–24 July, later counted 6,500 adults from 28 overlapping photographs taken from land vantage points. This count was converted to 4,418 pairs and rounded up to 4,500 pairs; it was reported as 5,000 pairs by R.M. Lockley in Wynne Edwards (1936).

Plate 23. Nesting Gannets and Guillemots on Sula Sgeir with North Rona 18 km away in the distance, 16 June 1986. © *Mark Tasker*

Two independent counts, including estimates for hidden ground, were made from the sea on two dates in June 1939. Darling (1943) recorded 4,000 pairs with breeding confined to the steeper cliff faces while Fisher (Fisher & Vevers 1943–44) estimated the population at 3,970 pairs. An attempted aerial survey in 1947 failed as photographs were too distant to give countable images. Numbers continued to increase and an aerial survey in 1969 reported 8,964 pairs (Lloyd *et al.* 1991). In the same year 3,500 chicks were counted on 26 July (NCC files). A land count by Evans (1971) in 1971 gave 9,000 pairs. Subsequent aerial surveys have reported 9,140 AOS in 1985 (Murray & Wanless 1986), 10,440 AOS in 1994 (Murray & Wanless 1997) and 9,225 AOS in 2004 (Murray *et al.* 2006). Concern that numbers were declining despite large increases at most other Scottish colonies proved unfounded since another survey on 18 June 2013 found 11,230 AOS (Murray *et al.* 2015), an increase of 22% since 2004. The most recent survey (30 June 2017) documented a further increase to 13,199 AOS.

The colony is the only one in the UK and Ireland where chicks ('gugas') are taken for human consumption. Up to 1983 Gannets of all

Plate 24. Guillemots breeding among Gannets near the light on Sula Sgeir showing the impossibility of counting the numbers of either species directly without causing havoc, 16 June 1986. © *Mark Tasker*

ages could be taken but since 1983 the license has been for 2,000 chicks. Recent licence returns have been 2,000 in 2013, 2015 and 2016, 1,987 in 2019, 1,900 in 2017 and 2021, 1,791 in 2018 and 1,723 in 2014 (NS records). Last century the numbers killed each year were typically between 2,000 and 3,000, with occasionally 4,000 and once 5,000 taken (MacGeoch 1968, NCC files). Without detailed data on chick production taking account of the harvest and collateral losses during the hunt, and adult and immature survival, a robust assessment of the impact of the guga hunt on the Sula Sgeir population is impossible. A population model using demographic data from other colonies suggested that at the current level the hunt reduced the rate of population growth rate below the level that would be predicted in the absence of a harvest (Trinder 2016). It also concluded that the population could sustain the current take of 2,000 chicks per year due partly to immigration, presumably from the neighbouring colonies of St Kilda and Sule Stack which are not increasing (Harris *et al.* 2019). However, this situation may well change with the emergence of Highly Pathogenic Avian Influenza in 2022 which has already caused major mortality at many Scottish gannetries (DEFRA 2022).

Shag *Gulosus aristotelis*
Most visitors have reported small numbers but around 100 were noted on 26 July 1989 and 3 June 2007. The species bred in the bothies and under large rocks between 1883 and 1949. Eight adults and four juveniles were counted in 1971 and 40 adults and 11 juveniles the following year. Ten nests were found in 1986 and five nests were noted on Lunndastoth in 2005. Two nests were found in 2021.

Short-eared Owl *Asjo flammeus*
One dead 16 June 1986.

Hooded Crow *Corvus cornix*
Two on 2 August 1980 and one 18 August 1986.

Raven *Corvus corax*
Single on 16 June 1986.

Waxwing *Bombycilla garrulus*
Single on 27 May 1965.

Swallow *Hirundo rustica*
Single on 12 May 2005.

House Martin *Delichon urbica*
Three on 29–30 June 1958 and one 16 June 1986.

Willow Warbler *Phylloscopus trochilus*
Up to three on 24–28 August 1954 and single 6 July 2017.

Wren *Troglodytes troglodytes*
One on an unknown date September 1930.

Starling *Sturnus vulgaris*
Present August 1954 and June/July 1971 when breeding suspected. One individual found soaked in Fulmar oil on 23 June 1980 and two dead 16 June 1986.

Spotted Flycatcher *Muscicapa striata*
Single on 19 June 1993.

Red-breasted Flycatcher *Ficedula parva*
Single on 21 May 1962.

Wheatear *Oenanthe oenanthe*
Passage August 1954 with a maximum of 60 on 22–23rd. Singles 29–30 June 1958, 21 May 1962 and 24 June 1971. No evidence of breeding.

White Wagtail *Motacilla alba*
Up to six on 24–31 August 1954, one 27 May 1965.

Meadow Pipit *Anthus pratensis*
Probably bred, adult seen carrying food on 29 and 30 June 1958. Migration late August 1954 with up to 50 seen. One on 27 May 1965.

Rock Pipit *Anthus littoralis*
Two pairs breeding in 1959, six pairs in 1971 and 1972. Present in 1932, 1939, 1954, 1958, 1962 and 1965. No recent reports but the species could easily be overlooked as visits are restricted to a small area around the landing rocks and bothies.

Crossbill *Loxia curvirosta*
Single male and two females on 7 July 1972, two females and one juvenile 26 July 1990.

Lapland Bunting *Calcarius lapponicus*
Two on 27 August 1954, five 11 September 1957.

Plate 25. Four archaeologists (arch) and three birdwatchers (bw) ashore on Sula Sgeir: Left to right are Dave Cowley (arch), Strat Halliday (arch), Ian Parker (arch), Tim Dee (bw), Stuart Murray (bw), Jill Harden (arch) and Kathleen Jamie (bw & poet). Their boat *Charlie2* is at anchor very close to shore, 5 July 2009. © *Stuart Murray*

Plate 26. Kathleen Jamie and Tim Dee doing housework at the SMRU hut, also known as the Rona Hilton, 3 July 2009. © *Stuart Murray*

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Plate 27. The automatic navigation beacon stands on the highest point amid the largest part of the Gannet colony, Sula Sgeir, Outer Hebrides, 30 June 2017. © *Stuart Murray*